

Form 3160-3
(June 2015)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM099034
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input checked="" type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator OXY USA INCORPORATED		8. Lease Name and Well No. HEADS CC 9-4 FEDERAL COM 21H
3a. Address 5 Greenway Plaza, Suite 110, Houston, TX 77046	3b. Phone No. (include area code) (713) 366-5716	9. API Well No. 30 015 47188
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NWSW / 1353 FSL / 1102 FWL / LAT 32.228574 / LONG -103.994479 At proposed prod. zone LOT 4 / 20 FNL / 330 FWL / LAT 32.253975 / LONG -103.997028		10. Field and Pool, or Exploratory CORRAL DRAW BONE SPRING/RED TA
11. Sec., T. R. M. or Blk. and Survey or Area SEC 9/T24S/R29E/NMP		
14. Distance in miles and direction from nearest town or post office* 8 miles		12. County or Parish EDDY
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 20 feet	16. No of acres in lease 878.94	17. Spacing Unit dedicated to this well 640.0
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 35 feet	19. Proposed Depth 8451 feet / 19604 feet	20. BLM/BIA Bond No. in file FED: ESB000226
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2940 feet	22. Approximate date work will start* 05/11/2020	23. Estimated duration 15 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be requested by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) DAVID STEWART / Ph: (713) 366-5716	Date 09/05/2019
Title Sr. Regulatory Advisor		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Christopher Walls / Ph: (575) 234-2234	Date 05/22/2020
Title Petroleum Engineer		
Office Carlsbad Field Office		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Entered - Kurt Simmons, NMOCD



(Continued on page 2)

*(Instructions on page 2)

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3480 Fax: (505) 476-3482

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-47188	Pool Code 96473	Pool Name Pierce Crossing Bone Spring, East
Property Code 328290	Property Name HEADS CC 9_4 FEDERAL COM	Well Number 21H
OGRID No. 16696	Operator Name OXY USA INC.	Elevation 2940.2'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	9	24-S	29-E		1353	SOUTH	1102	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
4	4	24-S	29-E		20	NORTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
640	Y		

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>PROPOSED BOTTOM HOLE LOCATION Y=456292.2 N X=645300.0 E LAT.=32.253975° N LONG.=103.997028° W</p> <p>LTP 100' FNL & 330' FWL Y=456212.2 N X=645300.4 E LAT.=32.253755° N LONG.=103.997028° W</p> <p>FIP 100' FSL & 330' FWL Y=445797.3 N X=645350.7 E LAT.=32.225126° N LONG.=103.996970° W</p> <p>KOP 50' FSL & 330' FWL Y=445747.3 N X=645350.9 E LAT.=32.224988° N LONG.=103.996970° W</p>	<p>LOT 3 8 LOT 2 LOT 1</p> <p>LOT 4 40.22 Ac 40.26 Ac 40.30 Ac 40.33 Ac</p> <p>HORIZONTAL SPACING UNIT</p> <p>SECTION 4</p> <p>SECTION 9</p> <p>GRID AZ. - 359°43'24" HORZ. DIST. - 10545.0'</p> <p>1102' S.L.</p> <p>GRID AZ. - 210°22'40" HORZ. DIST. - 1515.0'</p>	<p>* ALL COORDINATES ARE NAD 83 VALUES</p> <table border="1"><thead><tr><th colspan="2">POINT LEGEND</th></tr></thead><tbody><tr><td>1</td><td>Y=456311.0 N X=644989.9 E</td></tr><tr><td>2</td><td>Y=453880.3 N X=644983.8 E</td></tr><tr><td>3</td><td>Y=451008.8 N X=644997.4 E</td></tr><tr><td>4</td><td>Y=448351.8 N X=645008.9 E</td></tr><tr><td>5</td><td>Y=445695.4 N X=645021.1 E</td></tr><tr><td>6</td><td>Y=445710.8 N X=647866.6 E</td></tr><tr><td>7</td><td>Y=451020.7 N X=647841.0 E</td></tr><tr><td>8</td><td>Y=456320.9 N X=647815.9 E</td></tr></tbody></table> <p>SURFACE LOCATION Y=447054.3 N X=646117.0 E LAT.=32.228574° N LONG.=103.994479° W</p>	POINT LEGEND		1	Y=456311.0 N X=644989.9 E	2	Y=453880.3 N X=644983.8 E	3	Y=451008.8 N X=644997.4 E	4	Y=448351.8 N X=645008.9 E	5	Y=445695.4 N X=645021.1 E	6	Y=445710.8 N X=647866.6 E	7	Y=451020.7 N X=647841.0 E	8	Y=456320.9 N X=647815.9 E	<p>OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>Signature: <i>David Stewart</i> Date: 5/4/19</p> <p>Printed Name: David Stewart</p> <p>E-mail Address: David.Stewart@oxy.com</p> <p>SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>MAY 30, 2019</p> <p>Date of Survey</p> <p>Signature & Seal of Professional Surveyor</p> <p>CHAD L. HARCROW NEW MEXICO LICENSED PROFESSIONAL SURVEYOR 17777</p> <p><i>Chad Harcrow</i> 6/19/19</p> <p>Certificate No. CHAD HARCROW 17777</p> <p>W.O. #19-335 DRAWN BY: WN</p>
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7	Y=451020.7 N X=647841.0 E																				
8	Y=456320.9 N X=647815.9 E																				

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	OXY USA Inc.
LEASE NO.:	NMNM099034
WELL NAME & NO.:	HEADS CC 9-4 FEDERAL COM / 21H
SURFACE HOLE FOOTAGE:	1353'S & 1102'/W
BOTTOM HOLE FOOTAGE:	20'/N & 330'/W
LOCATION:	Section 9, T.24 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input type="radio"/> Low	<input checked="" type="radio"/> Medium	<input type="radio"/> High
Cave/Karst Potential	<input type="radio"/> Critical		
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input type="radio"/> Multibowl	<input checked="" type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input checked="" type="checkbox"/> Fluid Filled	<input checked="" type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

Break Testing	<input type="radio"/> Yes	<input checked="" type="radio"/> No
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A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

Casing Design:

1. The **10-3/4** inch surface casing shall be set at approximately **557** feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ Eddy County

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)
393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

- b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The **7-5/8** inch intermediate casing shall be set at approximately **7648** feet. The minimum required fill of cement behind the **7-5/8** inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

- ❖ In **Medium Cave/Karst Areas** if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

Operator has proposed to pump down 10-3/4" X 7-5/8" annulus. Operator must run a CBL from TD of the 7-5/8" casing to surface. Submit results to BLM.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

Option 1 (Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
- 2.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **3000 (3M)** psi.

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the

blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

- a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
- b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- c. Manufacturer representative shall install the test plug for the initial BOP test.
- d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
- e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

Offline Cementing

- Contact the BLM prior to the commencement of any offline cementing procedure.

BOP Break Testing Variance

- BOP break testing is not permitted on this well.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.



APD ID: 10400046976

Submission Date: 09/05/2019

Highlighted data
reflects the most
recent changes

Operator Name: OXY USA INCORPORATED

Well Name: HEADS CC 9-4 FEDERAL COM

Well Number: 21H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
530295	RUSTLER	2940	143	143	ANHYDRITE, DOLOMITE, SHALE	USEABLE WATER	N
530296	SALADO	2323	617	617	ANHYDRITE, DOLOMITE, HALITE, SHALE	OTHER : Salt	N
530297	CASTILE	1643	1297	1297	ANHYDRITE	OTHER : Salt	N
530298	LAMAR	78	2862	2909	LIMESTONE, SANDSTONE, SILTSTONE	NATURAL GAS, OIL, OTHER : Brine	N
530299	BELL CANYON	14	2926	2978	SANDSTONE, SILTSTONE	NATURAL GAS, OIL, OTHER : Brine	N
530300	CHERRY CANYON	-835	3775	3871	SANDSTONE, SILTSTONE	NATURAL GAS, OIL, OTHER : Brine	N
530301	BRUSHY CANYON	-2085	5025	5184	LIMESTONE, SANDSTONE, SILTSTONE	NATURAL GAS, OIL, OTHER : Brine	N
530302	BONE SPRING	-3657	6597	6834	LIMESTONE, SANDSTONE, SILTSTONE	NATURAL GAS, OIL	Y
530303	BONE SPRING 1ST	-4663	7603	7894	LIMESTONE, SANDSTONE, SILTSTONE	NATURAL GAS, OIL	Y
530304	BONE SPRING 2ND	-5478	8418	8880	LIMESTONE, SANDSTONE, SILTSTONE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 8475

Equipment: 13-5/8" 5M/10M Annular, Blind Ram, Double Ram

Requesting Variance? YES

Variance request: OXY requests a variance for the use of a flexible choke line from the BOP to Choke Manifold.

Testing Procedure: Oxy will utilize a 5M annular with a 10M BOPE stack. The BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which

Operator Name: OXY USA INCORPORATED

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Well Number: 21H

will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015. BOP Break Testing Request As per the agreement reached in the Oxy/BLM meeting on Feb 22, 2018, Oxy requests permission to allow BOP Break Testing under the following conditions: 1. After a full BOP test is conducted on the first well on the pad. 2. When skidding to drill an intermediate section that casing point is either shallower than the third Bone Spring or 10,000 feet TVD. 3. Full BOP test will be required prior to drilling any production hole.

Choke Diagram Attachment:

HeadsCC9_4FdCom21H_ChkManifold_20190904141357.pdf

BOP Diagram Attachment:

HeadsCC9_4FdCom21H_BOP_20190904141406.pdf

HeadsCC9_4FdCom21H_FlexHoseCert_20190904141419.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	14.75	10.75	NEW	API	N	0	557	0	557	2940	2383	557	J-55	40.5	BUTT	1.125	1.2	BUOY	1.4	BUOY	1.4
2	INTERMEDIATE	9.875	7.625	NEW	API	N	0	7939	0	7648	3101	-4708	7939	HCL-80	26.4	BUTT	1.125	1.2	BUOY	1.4	BUOY	1.4
3	PRODUCTION	6.75	5.5	NEW	API	N	0	19604	0	8451	3101	-5511	19604	P-110	20	OTHER - DQX/SFTO RQ/DQWTO RQ	1.125	1.2	BUOY	1.4	BUOY	1.4

Casing Attachments

Operator Name: OXY USA INCORPORATED

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Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

HeadsCC9_4FdCom21H_CsgCriteria_20190904141539.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

HeadsCC9_4FdCom21H_CsgCriteria_20190904141623.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

HeadsCC9_4FdCom21H_CsgCriteria_20190904141701.pdf

HeadsCC9_4FdCom21H_5.5_20_P110CY_TMKUPDQWTORQ_20190904141711.pdf

HeadsCC9_4FdCom21H_5.5_20_P110_DQX_20190904141711.pdf

HeadsCC9_4FdCom21H_5.5_20_P110HC_TMKUPSFTORQ_20190904141711.pdf

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Well Number: 21H

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	557	453	1.33	14.8	602	100	CI C	Accelerator

INTERMEDIATE	Lead		0	5275	649	1.92	12.9	1246	10	CI C	Accelerator
INTERMEDIATE	Tail		5275	7939	371	1.65	13.2	612	5	CI H	Retarder, Dispersant, Salt
PRODUCTION	Lead		7439	19604	892	1.38	13.2	1231	20	CI H	Retarder, Dispersant, Salt

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2.

Describe the mud monitoring system utilized: PVT/MD Totco/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
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Operator Name: OXY USA INCORPORATED

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Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	557	WATER-BASED MUD	8.6	8.8							
557	7939	OTHER : Saturated Brine Based Mud and/or Oil Based Mud	8	10							
7939	19604	OTHER : Water Based and/or oil Based Mud	8	9.6							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

GR from TD to surface (horizontal well - vertical portion of hole). Mud log from intermediate casing shoe to TD.

List of open and cased hole logs run in the well:

GAMMA RAY LOG, MUD LOG/GEOLOGICAL LITHOLOGY LOG,

Coring operation description for the well:

No coring is planned at this time.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4231

Anticipated Surface Pressure: 2366

Anticipated Bottom Hole Temperature(F): 148

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

HeadsCC9_4FdCom21H_H2S2_20190904142208.pdf

HeadsCC9_4FdCom21H_H2S3ECL_20190904142208.pdf

Operator Name: OXY USA INCORPORATED

Well Name: HEADS CC 9-4 FEDERAL COM

Well Number: 21H

HeadsCC9_4FdCom21H_H2S1_20190904142208.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

HeadsCC9_4FdCom21H_DirectPlan_20190904142248.pdf

HeadsCC9_4FdCom21H_DirectPlot_20190904142248.pdf

Other proposed operations facets description:

OXY requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancelation cone and not pump the second stage.

OXY requests the option to run production casing with DQX, SF TORQ, and/or DQW TORQ connections to accommodate hole conditions or drilling operations.

OXY requests to pump a two stage Intermediate casing cement job with the first stage being pumped conventionally with the calculated TOC @ the Brushy Canyon and the second stage performed as a bradenhead squeeze with planned cement from the top of the Brushy Canyon to Surface.

OXY requests a variance to cement the 7-5/8" intermediate casing string offline, see attached for additional information.

Annular Clearance Variance Request

As per the agreement reached in the OXY/BLM meeting on Feb 22, 2018, OXY requests permission to allow deviation from the 0.422 annular clearance requirement from Onshore Order #2 under the following conditions:

1. Annular clearance to meet or exceed 0.422 between intermediate casing ID and production casing coupling only on the first 500 overlap between both casings.
2. Annular clearance less than 0.422 is acceptable for the curve and lateral portions of the production open hole section.

Well will be drilled with a walking/skidding operation. Plan to drill the multiple well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.

OXY requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that OXY would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. See attached for additional spudder rig information.

Other proposed operations facets attachment:

HeadsCC9_4FdCom21H_DrillPlan_20190904142319.pdf

HeadsCC9_4FdCom21H_GasCapturePlan_20190904142331.pdf

HeadsCC9_4FdCom21H_SpudRigData_20190904142343.pdf

Other Variance attachment:

HeadsCC9_4FdCom21H_OfflineCmtgDetail_20190904142358.pdf

OXY's Minimum Design Criteria

Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

1) Casing Design Assumptions

a) Burst Loads

CSG Test (Surface)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Pore pressure in open hole.

CSG Test (Intermediate)

- Internal: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
- External: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

CSG Test (Production)

- Internal:
 - For Drilling: Displacement fluid + pressure required to comply with regulatory casing test pressures. This will comply with both Onshore Oil and Gas Order No. 2 and 19.15.16 of the OCD Rules.
 - For Production: The design pressure test should be the greater of (1) the planned test pressure prior to stimulation down the casing. (2) the regulatory test pressure, and (3) the expected gas lift system pressure. The design test fluid should be the fluid associated with pressure test having the greatest pressure.
- External:
 - For Drilling: Mud Weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.
 - For Production: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Column (Surface)

- Internal: Assumes a full column of gas in the casing with a Gas/Oil Gradient of 0.1 psi/ft in the absence of better information. It is limited to the controlling pressure based on the fracture pressure at the shoe or the maximum expected pore pressure within the next drilling interval, whichever results in a lower surface pressure.
- External: Fluid gradient below TOC, pore pressure from the TOC to the Intermediate CSG shoe (if applicable), and MW of the drilling mud that was in the hole when the CSG was run from Intermediate CSG shoe to surface.

Bullheading (Surface / Intermediate)

- Internal: The string must be designed to withstand a pressure profile based on the fracture pressure at the casing shoe with a column of water above the shoe plus an additional surface pressure (in psi) of $0.02 \times \text{MD of the shoe}$ to account for pumping friction pressure.
- External: Mud weight to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Gas Kick (Intermediate)

- The string must be designed to at least a gas kick load case unless the rig is unable to detect a kick. For the gas kick load case, the internal pressure profile must be based on a minimum volume of 50 bbl or the minimum kick detection capability of the rig, whichever is greater, and a kick intensity of 2.0 ppg for Class 1, 1.0 ppg of Class 2, and 0.5 ppg for Class 3 and 4 wells.
- Internal: Influx depth of the maximum pore pressure of 0.55 “gas kick gravity” of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Producing (Production)

- Internal: SITP plus a packer fluid gradient to the shoe or top of packer.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Tubing Leak Near Surface While Stimulating (Production)

- Internal: Surface pressure or pressure-relief system pressure, whichever is lower plus packer fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

Injection / Stimulation Down Casing (Production)

- Internal: Surface pressure plus injection fluid gradient.
- External: Mud base-fluid density to TOC, cement mix water gradient (8.4 ppg) below TOC, and pore pressure in open hole.

b) Collapse Loads

Lost Circulation (Surface / Intermediate)

- Internal: Lost circulation at the TD of the next hole section, and the fluid level falls to a depth where the hydrostatic of the mud equals pore pressure at the depth of the lost circulation zone.
- External: MW of the drilling mud that was in the hole when the casing was run.

Cementing (Surface / Intermediate / Production)

- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

c) Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.

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Burst, Collapse, and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software. A sundry will be requested if any lesser grade or different size casing is substituted.

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- Internal: Influx depth of the maximum pore pressure of 0.55 “gas kick gravity” of gas to surface while drilling the next hole section.
- External: Mud weight to the TOC, cement mix water gradient below TOC, and pore pressure in open hole.

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- Internal: Displacement fluid density.
- External: Mud weight from TOC to surface and cement slurry weight from TOC to casing shoe.

Full Evacuation (Production)

- Internal: Full void pipe.
- External: MW of drilling mud in the hole when the casing was run.

c) Tension Loads

Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

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Running Casing (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus the lesser of 100,000 lb or the string weight in air.

Green Cement (Surface / Intermediate / Production)

- Axial: Buoyant weight of the string plus cement plug bump pressure load.



Permian Drilling Hydrogen Sulfide Drilling Operations Plan New Mexico

Scope

This contingency plan establishes guidelines for the public, all company employees, and contract employees who's work activities may involve exposure to hydrogen sulfide (H₂S) gas.

While drilling this well, it is possible to encounter H₂S bearing formations. At all times, the first barrier to control H₂S emissions will be the drilling fluid, which will have a density high enough to control influx.

Objective

1. Provide an immediate and predetermined response plan to any condition when H₂S is detected. All H₂S detections in excess of 10 parts per million (ppm) concentration are considered an Emergency.
2. Prevent any and all accidents, and prevent the uncontrolled release of hydrogen sulfide into the atmosphere.
3. Provide proper evacuation procedures to cope with emergencies.
4. Provide immediate and adequate medical attention should an injury occur.

Discussion

Implementation:	This plan with all details is to be fully implemented before drilling to <u>commence</u> .
Emergency response Procedure:	This section outlines the conditions and denotes steps to be taken in the event of an emergency.
Emergency equipment Procedure:	This section outlines the safety and emergency equipment that will be required for the drilling of this well.
Training provisions:	This section outlines the training provisions that must be adhered to prior to drilling.
Drilling emergency call lists:	Included are the telephone numbers of all persons to be contacted should an emergency exist.
Briefing:	This section deals with the briefing of all people involved in the drilling operation.
Public safety:	Public safety personnel will be made aware of any potential evacuation and any additional support needed.
Check lists:	Status check lists and procedural check lists have been included to insure adherence to the plan.
General information:	A general information section has been included to supply support information.

Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on the well:

1. The hazards and characteristics of H₂S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H₂S detection.
4. Proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
5. Proper techniques for first aid and rescue procedures.
6. Physical effects of hydrogen sulfide on the human body.
7. Toxicity of hydrogen sulfide and sulfur dioxide.
8. Use of SCBA and supplied air equipment.
9. First aid and artificial respiration.
10. Emergency rescue.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H₂S on metal components. If high tensile strength tubular is to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling a well, blowout prevention and well control procedures.
3. The contents and requirements of the H₂S Drilling Operations Plan.

H₂S training refresher must have been taken within one year prior to drilling the well. Specifics on the well to be drilled will be discussed during the pre-spud meeting. H₂S and well control (choke) drills will be performed while drilling the well, at least on a weekly basis. This plan shall be available in the well site. All personnel will be required to carry the documentation proving that the H₂S training has been taken.

Service company and visiting personnel

- A. Each service company that will be on this well will be notified if the zone contains H₂S.
- B. Each service company must provide for the training and equipment of their employees before they arrive at the well site.
- C. Each service company will be expected to attend a well site briefing

Emergency Equipment Requirements

1. Well control equipment

The well shall have hydraulic BOP equipment for the anticipated pressures. Equipment is to be tested on installation and follow Oxy Well Control standard, as well as BLM Onshore Order #2.

Special control equipment:

- A. Hydraulic BOP equipment with remote control on ground. Remotely operated choke.
- B. Rotating head
- C. Gas buster equipment shall be installed before drilling out of surface pipe.

2. Protective equipment for personnel

- A. Four (4) 30-minute positive pressure air packs (2 at each briefing area) on location.
- B. Adequate fire extinguishers shall be located at strategic locations.
- C. Radio / cell telephone communication will be available at the rig.
 - Rig floor and trailers.
 - Vehicle.

3. Hydrogen sulfide sensors and alarms

- A. H₂S sensor with alarms will be located on the rig floor, at the bell nipple, and at the flow line. These monitors will be set to alarm at 10 ppm with strobe light, and audible alarm.
- B. Hand operated detectors with tubes.
- C. H₂S monitor tester (to be provided by contract Safety Company.)
- D. There shall be one combustible gas detector on location at all times.

4. Visual Warning Systems

- A. One sign located at each location entrance with the following language:

Caution – potential poison gas
Hydrogen sulfide
No admittance without authorization

Wind sock – wind streamers:

- A. One 36” (in length) wind sock located at protection center, at height visible from rig floor.
- B. One 36” (in length) wind sock located at height visible from pit areas.

Condition flags

- A. One each condition flag to be displayed to denote conditions.

green – normal conditions
yellow – potential danger
red – danger, H2S present

- B. Condition flag shall be posted at each location sign entrance.

5. Mud Program

The mud program is designed to minimize the risk of having H2S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H2S scavengers will be used to minimize the hazards while drilling. Below is a summary of the drilling program.

Mud inspection devices:

Garrett gas train or hatch tester for inspection of sulfide concentration in mud system.

6. Metallurgy

- A. Drill string, casing, tubing, wellhead, blowout preventers, drilling spools or adapters, kill lines, choke manifold, lines and valves shall be suitable for the H2S service.
- B. All the elastomers, packing, seals and ring gaskets shall be suitable for H2S service.

7. Well Testing

No drill stem test will be performed on this well.

8. Evacuation plan

Evacuation routes should be established prior to well spud for each well and discussed with all rig personnel.

9. Designated area

- A. Parking and visitor area: all vehicles are to be parked at a predetermined safe distance from the wellhead.
- B. There will be a designated smoking area.
- C. Two briefing areas on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area.

Emergency procedures

- A. In the event of any evidence of H₂S level above 10 ppm, take the following steps:
 - 1. The Driller will pick up off bottom, shut down the pumps, slow down the pipe rotation.
 - 2. Secure and don escape breathing equipment, report to the upwind designated safe briefing / muster area.
 - 3. All personnel on location will be accounted for and emergency search should begin for any missing, the Buddy System will be implemented.
 - 4. Order non-essential personnel to leave the well site, order all essential personnel out of the danger zone and upwind to the nearest designated safe briefing / muster area.
 - 5. Entrance to the location will be secured to a higher level than our usual “Meet and Greet” requirement, and the proper condition flag will be displayed at the entrance to the location.
 - 6. Take steps to determine if the H₂S level can be corrected or suppressed and, if so, proceed as required.
- B. If uncontrollable conditions occur:
 - 1. Take steps to protect and/or remove any public in the down-wind area from the rig – partial evacuation and isolation. Notify necessary public safety personnel and appropriate regulatory entities (i.e. BLM) of the situation.

2. Remove all personnel to the nearest upwind designated safe briefing / muster area or off location.
3. Notify public safety personnel of safe briefing / muster area.
4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.
5. Proceed with best plan (at the time) to regain control of the well. Maintain tight security and safety procedures.

C. Responsibility:

1. Designated personnel.
 - a. Shall be responsible for the total implementation of this plan.
 - b. Shall be in complete command during any emergency.
 - c. Shall designate a back-up.

- | | |
|---------------------|--|
| All personnel: | <ol style="list-style-type: none"> 1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw 2. Check status of personnel (buddy system). 3. Secure breathing equipment. 4. Await orders from supervisor. |
| Drill site manager: | <ol style="list-style-type: none"> 1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area. 2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system). 3. Determine H2S concentrations. 4. Assess situation and take control measures. |
| Tool pusher: | <ol style="list-style-type: none"> 1. Don escape unit Report to up nearest upwind designated safe briefing / muster area. 2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system). 3. Determine H2S concentration. 4. Assess situation and take control measures. |
| Driller: | <ol style="list-style-type: none"> 1. Don escape unit, shut down pumps, continue |

- | | |
|---|--|
| | rotating DP. |
| | 2. Check monitor for point of release. |
| | 3. Report to nearest upwind designated safe briefing / muster area. |
| | 4. Check status of personnel (in an attempt to rescue, use the buddy system). |
| | 5. Assigns least essential person to notify Drill Site Manager and tool pusher by quickest means in case of their absence. |
| | 6. Assumes the responsibilities of the Drill Site Manager and tool pusher until they arrive should they be absent. |
| Derrick man
Floor man #1
Floor man #2 | 1. Will remain in briefing / muster area until instructed by supervisor. |
| Mud engineer: | 1. Report to nearest upwind designated safe briefing / muster area. |
| | 2. When instructed, begin check of mud for ph and H2S level. (Garett gas train.) |
| Safety personnel: | 1. Mask up and check status of all personnel and secure operations as instructed by drill site manager. |

Taking a kick

When taking a kick during an H2S emergency, all personnel will follow standard Well control procedures after reporting to briefing area and masking up.

Open-hole logging

All unnecessary personnel off floor. Drill Site Manager and safety personnel should monitor condition, advise status and determine need for use of air equipment.

Running casing or plugging

Following the same “tripping” procedure as above. Drill Site Manager and safety personnel should determine if all personnel have access to protective equipment.

Ignition procedures

The decision to ignite the well is the responsibility of the operator (Oxy Drilling Management). The decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope controlling the blowout under the prevailing conditions at the well.

Instructions for igniting the well

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man (tool pusher or safety engineer) will check the atmosphere for explosive gases with the gas monitor. The other man is responsible for igniting the well.
2. Primary method to ignite: 25 mm flare gun with range of approximately 500 feet.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site best for protection, and which offers an easy escape route.
5. Before firing, check for presence of combustible gas.
6. After lighting, continue emergency action and procedure as before.
7. All unassigned personnel will remain in briefing area until instructed by supervisor or directed by the Drill Site Manager.

Remember: After well is ignited, burning hydrogen sulfide will convert to sulfur dioxide, which is also highly toxic. **Do not assume the area is safe after the well is ignited.**

Status check list

Note: All items on this list must be completed before drilling to production casing point.

1. H2S sign at location entrance.
2. Two (2) wind socks located as required.
3. Four (4) 30-minute positive pressure air packs (2 at each Briefing area) on location for all rig personnel and mud loggers.
4. Air packs inspected and ready for use.
5. Cascade system and hose line hook-up as needed.
6. Cascade system for refilling air bottles as needed.
7. Condition flag on location and ready for use.
8. H2S detection system hooked up and tested.
9. H2S alarm system hooked up and tested.
10. Hand operated H2S detector with tubes on location.
11. 1 – 100' length of nylon rope on location.
12. All rig crew and supervisors trained as required.
13. All outside service contractors advised of potential H2S hazard on well.
14. No smoking sign posted and a designated smoking area identified.
15. Calibration of all H2S equipment shall be noted on the IADC report.

Checked by:_____ Date:_____

Procedural check list during H2S events

Perform each tour:

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to ensure that it is in proper working order.
3. Make sure all the H2S detection system is operative.

Perform each week:

1. Check each piece of breathing equipment to make sure that demand or forced air regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you receive air or feel air flow.
2. BOP skills (well control drills).
3. Check supply pressure on BOP accumulator stand by source.
4. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.
5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume. (Air quality checked for proper air grade “D” before bringing to location)
6. Confirm pressure on all supply air bottles.
7. Perform breathing equipment drills with on-site personnel.
8. Check the following supplies for availability.
 - A. Emergency telephone list.
 - B. Hand operated H2S detectors and tubes.

General evacuation plan

1. When the company approved supervisor (Drill Site Manager, consultant, rig pusher, or driller) determines the H₂S gas cannot be limited to the well location and the public will be involved, he will activate the evacuation plan.
2. Drill Site Manager or designee will notify local government agency that a hazardous condition exists and evacuation needs to be implemented.
3. Company or contractor safety personnel that have been trained in the use of H₂S detection equipment and self-contained breathing equipment will monitor H₂S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.
4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.
5. After the discharge of gas has been controlled, company safety personnel will determine when the area is safe for re-entry.

Important: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.

Emergency actions

Well blowout – if emergency

1. Evacuate all personnel to “Safe Briefing / Muster Areas” or off location if needed.
2. If sour gas – evacuate rig personnel.
3. If sour gas – evacuate public within 3000 ft radius of exposure.
4. Don SCBA and shut well in if possible using the buddy system.
5. Notify Drilling Superintendent and call 911 for emergency help (fire dept and ambulance) if needed.
6. Implement the Blowout Contingency Plan, and Drilling Emergency Action Plan.
6. Give first aid as needed.

Person down location/facility

1. If immediately possible, contact 911. Give location and wait for confirmation.
2. Don SCBA and perform rescue operation using buddy system.

Toxic effects of hydrogen sulfide

Hydrogen sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 ppm, which is .001% by volume. Hydrogen sulfide is heavier than air (specific gravity – 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in table i. Physical effects at various hydrogen sulfide exposure levels are shown in table ii.

Table i
Toxicity of various gases

Common name	Chemical formula	Specific gravity (sc=1)	Threshold limit (1)	Hazardous limit (2)	Lethal concentration (3)
Hydrogen Cyanide	Hcn	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	H2S	1.18	10 ppm	250 ppm/hr	600 ppm
Sulfur Dioxide	So2	2.21	5 ppm	-	1000 ppm
Chlorine	Cl2	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	Co	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	Co2	1.52	5000 ppm	5%	10%
Methane	Ch4	0.55	90,000 ppm	Combustible above 5% in air	

- 1) threshold limit – concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.
- 2) hazardous limit – concentration that will cause death with short-term exposure.
- 3) lethal concentration – concentration that will cause death with short-term exposure.

Toxic effects of hydrogen sulfide

Table ii
Physical effects of hydrogen sulfide

<u>Percent (%)</u>	<u>Ppm</u>	<u>Concentration</u> Grains <u>100 std. Ft3*</u>	<u>Physical effects</u>
0.001	<10	00.65	Obvious and unpleasant odor.

0.002	10	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 – 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; stings eyes and throat.
0.050	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; followed by death within minutes.

*at 15.00 psia and 60'f.

Use of self-contained breathing equipment (SCBA)

1. Written procedures shall be prepared covering safe use of SCBA's in dangerous atmosphere, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available SCBA.
2. SCBA's shall be inspected frequently at random to insure that they are properly used, cleaned, and maintained.
3. Anyone who may use the SCBA's shall be trained in how to insure proper face-piece to face seal. They shall wear SCBA's in normal air and then wear them in a test atmosphere. (note: such items as facial hair {beard or sideburns} and eyeglasses will not allow proper seal.) Anyone that may be reasonably expected to wear SCBA's should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses or contact lenses.
4. Maintenance and care of SCBA's:
 - a. A program for maintenance and care of SCBA's shall include the following:
 1. Inspection for defects, including leak checks.
 2. Cleaning and disinfecting.
 3. Repair.
 4. Storage.
 - b. Inspection, self-contained breathing apparatus for emergency use shall be inspected monthly.
 1. Fully charged cylinders.
 2. Regulator and warning device operation.
 3. Condition of face piece and connections.
 4. Rubber parts shall be maintained to keep them pliable and prevent deterioration.
 - c. Routinely used SCBA's shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.
5. Persons assigned tasks that requires use of self-contained breathing equipment shall be certified physically fit (medically cleared) for breathing equipment usage at least annually.
6. SCBA's should be worn when:
 - A. Any employee works near the top or on top of any tank unless test reveals less than 10 ppm of H₂S.

- B. When breaking out any line where H₂S can reasonably be expected.
- C. When sampling air in areas to determine if toxic concentrations of H₂S exists.
- D. When working in areas where over 10 ppm H₂S has been detected.
- E. At any time there is a doubt as to the H₂S level in the area to be entered.

Rescue
First aid for H₂S poisoning

Do not panic!

Remain calm – think!

1. Don SCBA breathing equipment.
2. Remove victim(s) utilizing buddy system to fresh air as quickly as possible. (go up-wind from source or at right angle to the wind. Not down wind.)
3. Briefly apply chest pressure – arm lift method of artificial respiration to clean the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs.
4. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.
5. Hospital(s) or medical facilities need to be informed, before-hand, of the possibility of H₂S gas poisoning – no matter how remote the possibility is.
6. Notify emergency room personnel that the victim(s) has been exposed to H₂S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration.

Revised CM 6/27/2012

OXY Permian Delaware NM Basin Drilling & Completions Incident Reporting**OXY Permian Crisis Team Hotline Notification**

Person	Location	Office Phone	Cell/Mobile Phone
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Drilling & Completions Department			
Drilling & Completions Manager: John Willis	Houston	(713) 366-5556	(713) 259-1417
Drilling Superintendent: Simon Benavides	Houston	(713) 215-7403	(832) 528-3547
Completions Superintendent: Chris Winter	Houston	(713) 366-5212	(806) 239-8774
Drilling Eng. Supervisor: Diego Tellez	Houston	(713) 350-4602	(713) 303-4932
Drilling Eng. Supervisor: Randy Neel	Houston	(713) 215-7987	(713) 517-5544
Completions Eng. Supervisor: Evan Hinkel	Houston	(713) 366-5436	(281) 236-6153
Drilling & Completions HES Lead. Ryan Green	Houston	713-336-5753	281-520-5216
Drilling & Completions HES Advisor:Kenny Williams	Carlsbad	(432) 686-1434	(337) 208-0911
Drilling & Completions HES Advisor:Kyle Holden	Carlsbad	(432) 686-1435	(661) 369-5328
Drilling & Completions HES Advisor Sr:Dave Schmidt	Carlsbad		(559) 310-8572
Drilling & Completions HES Advisor. :Seth Doyle	Carlsbad		(337) 499-0756

HES / Enviromental & Regulatory Department	Location	Office	Cell Phone
Jon Hamil-HES Manager	Houston	(713) 497-2494	(832) 537-9885
Mark Birk-HES Manager	Houston	(713) 350-4615	(949) 413-3127
Austin Tramell	Midland	(432) 699-4208	(575) 499-4919
Rico Munoz	Midland	(432) 699-8366	(432) 803-4116
Amber DuckWorth	Midland		(832) 966-1879
Kelley Montgomery- Regulatory Manager	Houston	(713) 366-5716	(832) 454-8137
Sandra Musallam -Regulatory Lead	Houston	+1 (713) 366-5106	+1 (713) 504-8577
Bishop, Steve-DOT Pipeline Coordinator	Midland	432-685-5614	
Wilson, Dusty-Safety Advisor	Midland	432-685-5771	(432) 254-2336
John W Dittrich Eniromental Advisor	Midland		(575) 390-2828
William (Jack) Calhoun-Environmental Lead	Houston	+713 (350) 4906	(281) 917-8571
Robert Barrow-Risk Engineer Manager	Houston	(713) 366-5611	(832) 867-5336
Sarah Holmes-HSE Cordinator	Midland	432-685-5758	
Administrative	Location	Office	
Sarah Holmes	Midland	432-685-5830	
Robertson, Debbie	Midland	432-685-5812	
Laci Hollaway	Midland	(432) 685-5716	(432) 631-6341
Administrative	Location	Office	
Rosalinda Escajeda	Midland	432-685-5831	

Person	Location	Office Phone	Cell/Mobile Phone
Moreno, Leslie (contract)	Hobbs	575-397-8247	
Sehon, Angela (contractor)	Levelland	806-894-8347	
Vasquez, Claudia (contractor)	North Cowden	432-385-3120	
XstremeMD	Location	Office	
Medical Case Management	Orla, TX	(337) 205-9314	
Axiom Medical Consulting	Location	Office	
Medical Case Management		(877) 502-9466	
Regulatory Agencies			
Bureau of Land Management	Carlsbad, NM	(505) 887-6544	
Bureau of Land Management	Hobbs, NM	(505) 393-3612	
Bureau of Land Management	Roswell, NM	(505) 393-3612	
Bureau of Land Management	Santa Fe, NM	(505) 988-6030	
DOT Juisdictional Pipelines-Incident Reporting New Mexico Public Regulaion Commission	Santa Fe, NM	(505) 827-3549 (505) 490-2375	
DOT Juisdictional Pipelines-Incident Reporting Texas Railroad Commission	Austin, TX	(512) 463-6788	
EPA Hot Line	Dallas, Texas	(214) 665-6444	
Federal OSHA, Area Office	Lubbock, Texas	(806) 472-7681	
National Response Center	Washington, D. C.	(800) 424-8802	
National Infrastructure Coordinator Center		(202) 282-9201	
New Mexico Air Quality Bureau	Santa Fe, NM	(505) 827-1494	
New Mexico Oil Conservation Division	Artesia, NM	(505) 748-1283	After Hours (505) 370-7545
New Mexico Oil Conservation Division	Hobbs, NM	(505) 393-6161	
New Mexico Oil Conservation Division	Santa Fe, NM	(505) 471-1068	
New Mexico OCD Environmental Bureau	Santa Fe, NM	(505) 476-3470	
New Mexico Environmental Department	Hobbs, NM	(505) 827-9329	
NM State Emergency Response Center	Santa Fe, NM	(505) 827-9222	
Railroad Commission of TX	District 1 San Antonio,	(210) 227-1313	
Railroad Commission of TX	District 7C San Angelo	(325) 657-7450	
Railroad Commission of TX	District 8, 8A Midland	(432) 684-5581	
Texas Emergency Response Center	Austin, TX	(512) 463-7727	
TCEQ Air	Region 2 Lubbock, TX	(806) 796-3494	
TCEQ Water/Waste/Air	Region 3 Abilene, TX	(325) 698-9674	
TCEQ Water/Waste/Air	Region 7 Midland, TX	(432) 570-1359	
TCEQ Water/Waste/Air	Region 9 San Antonio,	(512) 734-7981	
TCEQ Water/Waste/Air	Region 8 San Angelo	(325) 655-9479	
Medical Facilities			
Abernathy Medical Clinic	Abernathy, TX	(806) 298-2524	
Alliance Hospital	Odessa, TX	(432) 550-1000	
Artesia General Hospital	Artesia, NM	(505) 748-3333	
Brownfield Regional Medical Center	Brownfield, TX	(806) 637-3551	

Person	Location	Office Phone	Cell/Mobile Phone
Cogdell Memorial Hospital	Snyder, TX	(325) 573-6374	
Covenant Hospital Levelland	Levelland, TX	(806) 894-4963	
Covenant Medical Center	Lubbock, TX	(806) 725-1011	
Covenant Medical Center Lakeside	Lubbock, TX	(806) 725-6000	
Covenant Family Health	Snyder, TX	(325) 573-1300	
Crockett County Hospital	Ozona, TX	(325) 392-2671	
Guadalupe Medical Center	Carlsbad, NM	(505) 887-6633	
Lea Regional Hospital	Hobbs, NM	(505) 492-5000	
McCamey Hospital	McCamey, TX	(432) 652-8626	
Medical Arts Hospital	Lamesa, TX	(806) 872-2183	
Medical Center Hospital	Odessa, TX	(432) 640-4000	
Medi Center Hospital	San Angelo, TX	(325) 653-6741	
Memorial Hospital	Ft. Stockton	(432) 336-2241	
Memorial Hospital	Seminole, TX	(432) 758-5811	
Midland Memorial Hospital	Midland, TX	(432) 685-1111	
Nor-Lea General Hospital	Lovington, NM	(505) 396-6611	
Odessa Regional Hospital	Odessa, TX	(432) 334-8200	
Permian General Hospital	Andrews, TX	(432) 523-2200	
Reagan County Hospital	Big Lake, TX	(325) 884-2561	
Reeves County Hospital	Pecos, TX	(432) 447-3551	
Shannon Medical Center	San Angelo, TX	(325) 653-6741	
Union County General Hospital	Clayton, NM	(505) 374-2585	
University Medical Center	Lubbock, TX	(806) 725-8200	
Val Verde Regional Medical Center	Del Rio, TX	(830) 775-8566	
Ward Memorial Hospital	Monahans, TX	(432) 943-2511	
Yoakum County Hospital	Denver City, TX	(806) 592-5484	
Law Enforcement - Sheriff			
Andrews Cty Sheriff's Department	Andrews County(Andr	(432) 523-5545	
Crane Cty Sheriff's Department	Crane, County (Crane)	(432) 558-3571	
Crockett Cty Sheriff's Department	Crockett County (Ozor	(325) 392-2661	
Dawson Cty Sheriff's Department	Dawson County (Lame	(806) 872-7560	
Ector Cty Sheriff's Department	Ector County (Odessa)	(432) 335-3050	
Eddy Cty Sheriff's Department	Eddy County (Artesia)	(505) 746-2704	
Eddy Cty Sheriff's Department	Eddy County (Carlsbad	(505) 887-7551	
Gaines Cty Sheriff's Department	Gaines County (Semin	(432) 758-9871	
Hockley Cty Sheriff's Department	Hockley County(Level	(806) 894-3126	
Kent Cty (Jayton City Sheriff's Dept.)	Kent County(Jayton)	(806) 237-3801	
Lea Cty Sheriff's Department	Lea County (Eunice)	(505) 384-2020	
Lea Cty Sheriff's Department	Lea County (Hobbs)	(505) 393-2515	
Lea Cty Sheriff's Department	Lea County (Lovington	(505) 396-3611	
Lubbock Cty Sheriff's Department	Lubbock Cty (Abernati	(806) 296-2724	
Midland Cty Sheriff's Department	Midland County (Midl	(432) 688-1277	

Person	Location	Office Phone	Cell/Mobile Phone
Pecos Cty Sheriff's Department	Pecos County (Iraan)	(432) 639-2251	
Reeves Cty Sheriff's Department	Reeves County (Pecos)	(432) 445-4901	
Scurry Cty Sheriff's Department	Scurry County (Snyder)	(325) 573-3551	
Terry Cty Sheriff's Department	Terry County (Brownfi)	(806) 637-2212	
Union Cty Sheriff's Department	Union County (Clayton)	(505) 374-2583	
Upton Cty Sheriff's Department	Upton County (Rankin)	(432) 693-2422	
Ward Cty Sheriff's Department	Ward County (Monaha)	(432) 943-3254	
Yoakum City Sheriff's Department	Yoakum Co. (Denever)	(806) 456-2377	
Law Enforcement - Police			
Abernathy City Police	Abernathy, TX	(806) 298-2545	
Andrews City Police	Andrews, TX	(432) 523-5675	
Artesia City Police	Artesia, NM	(505) 746-2704	
Brownfield City Police	Brownfield, TX	(806) 637-2544	
Carlsbad City Police	Carlsbad, NM	(505) 885-2111	
Clayton City Police	Clayton, NM	(505) 374-2504	
Denver City Police	Denver City, TX	(806) 592-3516	
Eunice City Police	Eunice, NM	(505) 394-2112	
Hobbs City Police	Hobbs, NM	393-2677	
Jal City Police	Jal, NM	(505) 395-2501	
Jayton City Police	Jayton, TX	(806) 237-3801	
Lamesa City Police	Lamesa, TX	(806) 872-2121	
Levelland City Police	Levelland, TX	(806) 894-6164	
Lovington City Police	Lovington, NM	(505) 396-2811	
Midland City Police	Midland, TX	(432) 685-7113	
Monahans City Police	Monahans, TX	(432) 943-3254	
Odessa City Police	Odessa, TX	(432) 335-3378	
Seminole City Police	Seminole, TX	(432) 758-9871	
Snyder City Police	Snyder, TX	(325) 573-2611	
Sundown City Police	Sundown, TX	(806) 229-8241	
Law Enforcement - FBI			
FBI	Albuquerque, NM	(505) 224-2000	
FBI	Midland, TX	(432) 570-0255	
Law Enforcement - DPS			
NM State Police	Artesia, NM	(505) 746-2704	
NM State Police	Carlsbad, NM	(505) 885-3137	
NM State Police	Eunice, NM	(505) 392-5588	
NM State Police	Hobbs, NM	(505) 392-5588	
NM State Police	Clayton, NM	(505) 374-2473; 911	
TX Dept of Public Safety	Andrews, TX	(432) 524-1443	
TX Dept of Public Safety	Big Lake, TX	(325) 884-2301	

Person	Location	Office Phone	Cell/Mobile Phone
TX Dept of Public Safety	Brownfield, TX	(806) 637-2312	
TX Dept of Public Safety	Iraan, TX	(432) 639-3232	
TX Dept of Public Safety	Lamesa, TX	(806) 872-8675	
TX Dept of Public Safety	Levelland, TX	(806) 894-4385	
TX Dept of Public Safety	Lubbock, TX	(806) 747-4491	
TX Dept of Public Safety	Midland, TX	(432) 697-2211	
TX Dept of Public Safety	Monahans, TX	(432) 943-5857	
TX Dept of Public Safety	Odessa, TX	(432) 332-6100	
TX Dept of Public Safety	Ozona, TX	(325) 392-2621	
TX Dept of Public Safety	Pecos, TX	(432) 447-3533	
TX Dept of Public Safety	Seminole, TX	(432) 758-4041	
TX Dept of Public Safety	Snyder, TX	(325) 573-0113	
TX Dept of Public Safety	Terry County TX	(806) 637-8913	
TX Dept of Public Safety	Yoakum County TX	(806) 456-2377	
Firefighting & Rescue			
Abernathy	Abernathy, TX	(806) 298-2022	
Amistad/Rosebud	Amistad/Rosebud, NM	(505) 633-9113	
Andrews	Andrews, TX	523-3111	
Artesia	Artesia, NM	(505) 746-5051	
Big Lake	Big Lake, TX	(325) 884-3650	
Brownfield-Administrative & other calls	Brownfield, TX	(816) 637-4547	
Brownfield emergency only	Brownfield, TX	-911	
Carlsbad	Carlsbad, NM	(505) 885-3125	
Clayton	Clayton, NM	(505) 374-2435	
Cotton Center	Cotton Center, TX	(806) 879-2157	
Crane	Crane, TX	(432) 558-2361	
Del Rio	Del Rio, TX	(830) 774-8650	
Denver City	Denver City, TX	(806) 592-3516	
Eldorado	Eldorado, TX	(325) 853-2691	
Eunice	Eunice, NM	(505) 394-2111	
Garden City	Garden City, TX	(432) 354-2404	
Goldsmith	Goldsmith, TX	(432) 827-3445	
Hale Center	Hale Center, TX	(806) 839-2411	
Halfway	Halfway, TX		
Hobbs	Hobbs, NM	(505) 397-9308	
Jal	Jal, NM	(505) 395-2221	
Jayton	Jayton, TX	(806) 237-3801	
Kermit	Kermit, TX	(432) 586-3468	
Lamesa	Lamesa, TX	(806) 872-4352	
Levelland	Levelland, TX	(806) 894-3154	
Lovington	Lovington, NM	(505) 396-2359	
Maljamar	Maljamar, NM	(505) 676-4100	

Person	Location	Office Phone	Cell/Mobile Phone
McCamey	McCamey, TX	(432) 652-8232	
Midland	Midland, TX	(432) 685-7346	
Monahans	Monahans, TX	(432) 943-4343	
Nara Visa	Nara Visa, NM	(505) 461-3300	
Notrees	Notress, TX	(432) 827-3445	
Odessa	Odessa, TX	(432) 335-4659	
Ozona	Ozona, TX	(325) 392-2626	
Pecos	Pecos, TX	(432) 445-2421	
Petersburg	Petersburg, TX	(806) 667-3461	
Plains	Plains, TX	(806) 456-8067	
Plainview	Plainview, TX	(806) 296-1170	
Rankin	Rankin, TX	(432) 693-2252	
San Angelo	San Angelo, TX	(325) 657-4355	
Sanderson	Sanderson, TX	(432) 345-2525	
Seminole	Seminole, TX	758-9871	
Smyer	Smyer, TX	(806) 234-3861	
Snyder	Snyder, TX	(325) 573-6215	
Sundown	Sundown, TX	911	
Tucumcari	Tucumcari, NM	911	
West Odessa	Odessa, TX	(432) 381-3033	
Ambulance			
Abernathy Ambulance	Abernathy, TX	(806) 298-2241	
Amistad/Rosebud	Amistad/Rosebud, NM	(505) 633-9113	
Andrews Ambulance	Andrews, TX	(432) 523-5675	
Artesia Ambulance	Artesia, NM	(505) 746-2701	
Big Lake Ambulance	Big Lake, TX	(325) 884-2423	
Big Spring Ambulance	Big Spring, TX	(432) 264-2550	
Brownfield Ambulance	Brownfield, TX	(806) 637-2511	
Carlsbad Ambulance	Carlsbad, NM	(505) 885-2111; 911	
Clayton, NM	Clayton, NM	(505) 374-2501	
Denver City Ambulance	Denver City, TX	(806) 592-3516	
Eldorado Ambulance	Eldorado, TX	(325) 853-3456	
Eunice Ambulance	Eunice, NM	(505) 394-3258	
Goldsmith Ambulance	Goldsmith, TX	(432) 827-3445	
Hobbs, NM	Hobbs, NM	(505) 397-9308	
Jal, NM	Jal, NM	(505) 395-2501	
Jayton Ambulance	Jayton, TX	(806) 237-3801	
Lamesa Ambulance	Lamesa, TX	(806) 872-3464	
Levelland Ambulance	Levelland, TX	(806) 894-8855	
Lovington Ambulance	Lovington, NM	(505) 396-2811	
McCamey Hospital	McCamey, TX	(432) 652-8626	
Midland Ambulance	Midland, TX	(432) 685-7499	

Person	Location	Office Phone	Cell/Mobile Phone
Monahans Ambulance	Monahans, TX	3731	
Nara Visa, NM	Nara Visa, NM	(505) 461-3300	
Odessa Ambulance	Odessa, TX	(432) 335-3378	
Ozona Ambulance	Ozona, TX	(325) 392-2671	
Pecos Ambulance	Pecos, TX	(432) 445-4444	
Rankin Ambulance	Rankin, TX	(432) 693-2443	
San Angelo Ambulance	San Angelo, TX	(325) 657-4357	
Seminole Ambulance	Seminole, TX	758-9871	
Snyder Ambulance	Snyder, TX	(325) 573-1911	
Stanton Ambulance	Stanton, TX	(432) 756-2211	
Sundown Ambulance	Sundown, TX	911	
Tucumcari, NM	Tucumcari, NM	911	
Medical Air Ambulance Service			
AEROCARE - Methodist Hospital	Lubbock, TX	(800) 627-2376	
San Angelo Med-Vac Air Ambulance	San Angelo, TX	(800) 277-4354	
Southwest Air Ambulance Service	Stanford, TX	(800) 242-6199	
Southwest MediVac	Snyder, TX	(800) 242-6199	
Southwest MediVac	Hobbs, NM	(800) 242-6199	
Odessa Care Star	Odessa, TX	(888) 624-3571	
NWTH Medivac	Amarillo, TX	(800) 692-1331	



Permian Drilling Hydrogen Sulfide Drilling Operations Plan Heads CC 9-4 Federal Com 21H

Open drill site. No homes or buildings are near the proposed location.

1. Escape

Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the Southeast side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction, then a secondary egress route should be taken.

▲ H2S Detectors. At least three detectors will be installed: bell nipple, rig floor and Shakers.

● Briefing Areas. At least two briefing areas will be placed, 90 deg off.

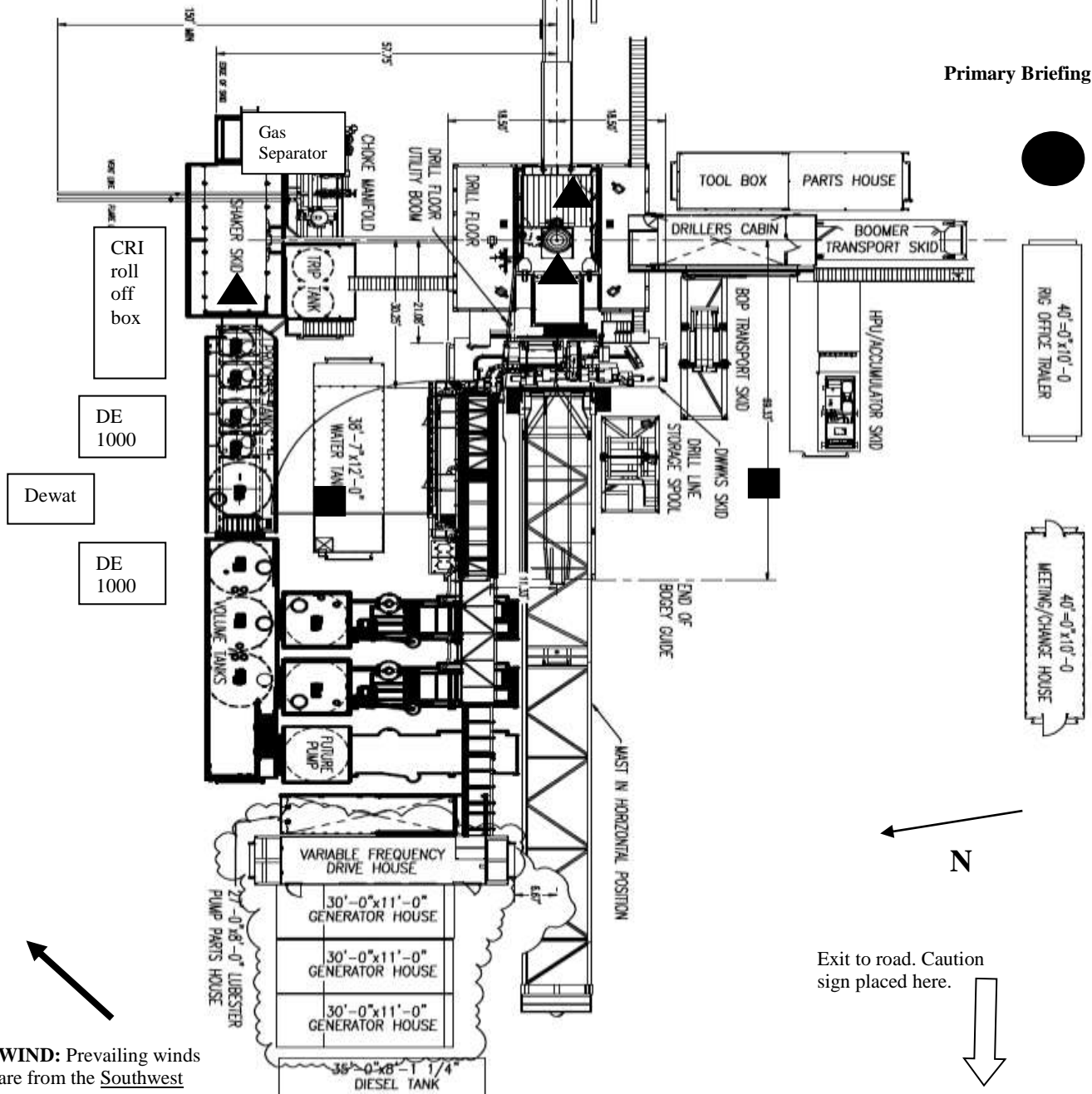
■ Wind direction indicators. Visible from rig floor and from the mud pits area.

A gas buster is connected to both the choke manifold and flowline outlets.

Secondary Briefing Area

Secondary Egress

Primary Briefing Area



WIND: Prevailing winds are from the Southwest

OXY

PRD NM DIRECTIONAL PLANS (NAD 1983)

Heads CC 9_4

Heads CC 9_4 Federal Com 21H

Wellbore #1

Plan: Permitting Plan

Standard Planning Report

17 July, 2019

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Heads CC 9_4 Federal Com 21H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2966.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2966.70ft
Site:	Heads CC 9_4	North Reference:	Grid
Well:	Heads CC 9_4 Federal Com 21H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Project	PRD NM DIRECTIONAL PLANS (NAD 1983)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site		Heads CC 9_4				
Site Position:		Northing:	446,198.60 usft	Latitude:	32° 13' 34.318660 N	
From:	Map	Easting:	648,677.50 usft	Longitude:	103° 59' 10.348611 W	
Position Uncertainty:		2.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.19 °

Well	Heads CC 9_4 Federal Com 21H					
Well Position	+N/-S	855.77 ft	Northing:	447,054.30 usft	Latitude:	32° 13' 42.867457 N
	+E/-W	-2,560.70 ft	Easting:	646,117.00 usft	Longitude:	103° 59' 40.126059 W
Position Uncertainty		2.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	2,940.20 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/17/2019	6.97	59.95	47,892

Design	Permitting Plan			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	354.95

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,347.00	0.00	0.00	1,347.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,246.82	18.00	200.59	2,232.10	-131.21	-49.29	2.00	2.00	0.00	200.59	
8,039.37	18.00	200.59	7,741.25	-1,806.55	-678.64	0.00	0.00	0.00	0.00	
9,108.47	90.13	359.72	8,474.70	-1,257.10	-766.36	10.00	6.75	14.88	158.14	FTP (Heads CC 9_4
19,604.36	90.13	359.72	8,450.70	9,238.64	-817.07	0.00	0.00	0.00	0.00	PBHL (Heads CC

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Heads CC 9_4 Federal Com 21H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2966.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2966.70ft
Site:	Heads CC 9_4	North Reference:	Grid
Well:	Heads CC 9_4 Federal Com 21H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,347.00	0.00	0.00	1,347.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	1.06	200.59	1,400.00	-0.46	-0.17	-0.44	2.00	2.00	0.00
1,500.00	3.06	200.59	1,499.93	-3.82	-1.44	-3.68	2.00	2.00	0.00
1,600.00	5.06	200.59	1,599.67	-10.45	-3.93	-10.06	2.00	2.00	0.00
1,700.00	7.06	200.59	1,699.11	-20.33	-7.64	-19.58	2.00	2.00	0.00
1,800.00	9.06	200.59	1,798.11	-33.46	-12.57	-32.22	2.00	2.00	0.00
1,900.00	11.06	200.59	1,896.57	-49.81	-18.71	-47.97	2.00	2.00	0.00
2,000.00	13.06	200.59	1,994.36	-69.37	-26.06	-66.80	2.00	2.00	0.00
2,100.00	15.06	200.59	2,091.36	-92.11	-34.60	-88.70	2.00	2.00	0.00
2,200.00	17.06	200.59	2,187.45	-118.00	-44.33	-113.64	2.00	2.00	0.00
2,246.82	18.00	200.59	2,232.10	-131.21	-49.29	-126.35	2.00	2.00	0.00
2,300.00	18.00	200.59	2,282.68	-146.59	-55.07	-141.16	0.00	0.00	0.00
2,400.00	18.00	200.59	2,377.78	-175.51	-65.93	-169.02	0.00	0.00	0.00
2,500.00	18.00	200.59	2,472.89	-204.43	-76.80	-196.87	0.00	0.00	0.00
2,600.00	18.00	200.59	2,568.00	-233.35	-87.66	-224.72	0.00	0.00	0.00
2,700.00	18.00	200.59	2,663.11	-262.28	-98.52	-252.58	0.00	0.00	0.00
2,800.00	18.00	200.59	2,758.21	-291.20	-109.39	-280.43	0.00	0.00	0.00
2,900.00	18.00	200.59	2,853.32	-320.12	-120.25	-308.28	0.00	0.00	0.00
3,000.00	18.00	200.59	2,948.43	-349.04	-131.12	-336.13	0.00	0.00	0.00
3,100.00	18.00	200.59	3,043.54	-377.96	-141.98	-363.99	0.00	0.00	0.00
3,200.00	18.00	200.59	3,138.64	-406.89	-152.85	-391.84	0.00	0.00	0.00
3,300.00	18.00	200.59	3,233.75	-435.81	-163.71	-419.69	0.00	0.00	0.00
3,400.00	18.00	200.59	3,328.86	-464.73	-174.58	-447.55	0.00	0.00	0.00
3,500.00	18.00	200.59	3,423.97	-493.65	-185.44	-475.40	0.00	0.00	0.00
3,600.00	18.00	200.59	3,519.07	-522.58	-196.31	-503.25	0.00	0.00	0.00
3,700.00	18.00	200.59	3,614.18	-551.50	-207.17	-531.10	0.00	0.00	0.00
3,800.00	18.00	200.59	3,709.29	-580.42	-218.04	-558.96	0.00	0.00	0.00
3,900.00	18.00	200.59	3,804.40	-609.34	-228.90	-586.81	0.00	0.00	0.00
4,000.00	18.00	200.59	3,899.50	-638.27	-239.77	-614.66	0.00	0.00	0.00
4,100.00	18.00	200.59	3,994.61	-667.19	-250.63	-642.51	0.00	0.00	0.00
4,200.00	18.00	200.59	4,089.72	-696.11	-261.50	-670.37	0.00	0.00	0.00
4,300.00	18.00	200.59	4,184.83	-725.03	-272.36	-698.22	0.00	0.00	0.00
4,400.00	18.00	200.59	4,279.93	-753.96	-283.23	-726.07	0.00	0.00	0.00
4,500.00	18.00	200.59	4,375.04	-782.88	-294.09	-753.93	0.00	0.00	0.00
4,600.00	18.00	200.59	4,470.15	-811.80	-304.96	-781.78	0.00	0.00	0.00
4,700.00	18.00	200.59	4,565.26	-840.72	-315.82	-809.63	0.00	0.00	0.00
4,800.00	18.00	200.59	4,660.37	-869.64	-326.69	-837.48	0.00	0.00	0.00
4,900.00	18.00	200.59	4,755.47	-898.57	-337.55	-865.34	0.00	0.00	0.00
5,000.00	18.00	200.59	4,850.58	-927.49	-348.42	-893.19	0.00	0.00	0.00
5,100.00	18.00	200.59	4,945.69	-956.41	-359.28	-921.04	0.00	0.00	0.00

Oxy

Planning Report

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Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2966.70ft
Site:	Heads CC 9_4	North Reference:	Grid
Well:	Heads CC 9_4 Federal Com 21H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,200.00	18.00	200.59	5,040.80	-985.33	-370.15	-948.90	0.00	0.00	0.00
5,300.00	18.00	200.59	5,135.90	-1,014.26	-381.01	-976.75	0.00	0.00	0.00
5,400.00	18.00	200.59	5,231.01	-1,043.18	-391.88	-1,004.60	0.00	0.00	0.00
5,500.00	18.00	200.59	5,326.12	-1,072.10	-402.74	-1,032.45	0.00	0.00	0.00
5,600.00	18.00	200.59	5,421.23	-1,101.02	-413.60	-1,060.31	0.00	0.00	0.00
5,700.00	18.00	200.59	5,516.33	-1,129.95	-424.47	-1,088.16	0.00	0.00	0.00
5,800.00	18.00	200.59	5,611.44	-1,158.87	-435.33	-1,116.01	0.00	0.00	0.00
5,900.00	18.00	200.59	5,706.55	-1,187.79	-446.20	-1,143.86	0.00	0.00	0.00
6,000.00	18.00	200.59	5,801.66	-1,216.71	-457.06	-1,171.72	0.00	0.00	0.00
6,100.00	18.00	200.59	5,896.76	-1,245.64	-467.93	-1,199.57	0.00	0.00	0.00
6,200.00	18.00	200.59	5,991.87	-1,274.56	-478.79	-1,227.42	0.00	0.00	0.00
6,300.00	18.00	200.59	6,086.98	-1,303.48	-489.66	-1,255.28	0.00	0.00	0.00
6,400.00	18.00	200.59	6,182.09	-1,332.40	-500.52	-1,283.13	0.00	0.00	0.00
6,500.00	18.00	200.59	6,277.19	-1,361.33	-511.39	-1,310.98	0.00	0.00	0.00
6,600.00	18.00	200.59	6,372.30	-1,390.25	-522.25	-1,338.83	0.00	0.00	0.00
6,700.00	18.00	200.59	6,467.41	-1,419.17	-533.12	-1,366.69	0.00	0.00	0.00
6,800.00	18.00	200.59	6,562.52	-1,448.09	-543.98	-1,394.54	0.00	0.00	0.00
6,900.00	18.00	200.59	6,657.62	-1,477.01	-554.85	-1,422.39	0.00	0.00	0.00
7,000.00	18.00	200.59	6,752.73	-1,505.94	-565.71	-1,450.24	0.00	0.00	0.00
7,100.00	18.00	200.59	6,847.84	-1,534.86	-576.58	-1,478.10	0.00	0.00	0.00
7,200.00	18.00	200.59	6,942.95	-1,563.78	-587.44	-1,505.95	0.00	0.00	0.00
7,300.00	18.00	200.59	7,038.05	-1,592.70	-598.31	-1,533.80	0.00	0.00	0.00
7,400.00	18.00	200.59	7,133.16	-1,621.63	-609.17	-1,561.66	0.00	0.00	0.00
7,500.00	18.00	200.59	7,228.27	-1,650.55	-620.04	-1,589.51	0.00	0.00	0.00
7,600.00	18.00	200.59	7,323.38	-1,679.47	-630.90	-1,617.36	0.00	0.00	0.00
7,700.00	18.00	200.59	7,418.49	-1,708.39	-641.77	-1,645.21	0.00	0.00	0.00
7,800.00	18.00	200.59	7,513.59	-1,737.32	-652.63	-1,673.07	0.00	0.00	0.00
7,900.00	18.00	200.59	7,608.70	-1,766.24	-663.50	-1,700.92	0.00	0.00	0.00
8,000.00	18.00	200.59	7,703.81	-1,795.16	-674.36	-1,728.77	0.00	0.00	0.00
8,039.37	18.00	200.59	7,741.25	-1,806.55	-678.64	-1,739.74	0.00	0.00	0.00
8,100.00	12.57	211.00	7,799.73	-1,820.98	-685.34	-1,753.53	10.00	-8.96	17.17
8,200.00	6.64	263.52	7,898.44	-1,830.99	-696.71	-1,762.49	10.00	-5.92	52.51
8,300.00	11.38	324.58	7,997.38	-1,823.58	-708.21	-1,754.10	10.00	4.73	61.07
8,400.00	20.34	341.51	8,093.52	-1,799.00	-719.46	-1,728.62	10.00	8.97	16.93
8,500.00	29.96	348.12	8,183.95	-1,757.97	-730.14	-1,686.82	10.00	9.61	6.61
8,600.00	39.75	351.70	8,265.92	-1,701.76	-739.92	-1,629.96	10.00	9.79	3.59
8,700.00	49.61	354.06	8,336.95	-1,632.07	-748.50	-1,559.79	10.00	9.86	2.35
8,800.00	59.51	355.80	8,394.86	-1,551.02	-755.62	-1,478.42	10.00	9.90	1.74
8,900.00	69.43	357.22	8,437.91	-1,461.06	-761.06	-1,388.33	10.00	9.92	1.42
9,000.00	79.36	358.46	8,464.78	-1,364.94	-764.66	-1,292.27	10.00	9.93	1.24
9,100.00	89.29	359.63	8,474.66	-1,265.57	-766.31	-1,193.14	10.00	9.93	1.16
9,108.47	90.13	359.72	8,474.70	-1,257.10	-766.36	-1,184.70	10.00	9.93	1.15
9,200.00	90.13	359.72	8,474.49	-1,165.57	-766.80	-1,093.49	0.00	0.00	0.00
9,300.00	90.13	359.72	8,474.26	-1,065.57	-767.29	-993.83	0.00	0.00	0.00
9,400.00	90.13	359.72	8,474.03	-965.57	-767.77	-894.18	0.00	0.00	0.00
9,500.00	90.13	359.72	8,473.80	-865.58	-768.25	-794.53	0.00	0.00	0.00
9,600.00	90.13	359.72	8,473.58	-765.58	-768.74	-694.88	0.00	0.00	0.00
9,700.00	90.13	359.72	8,473.35	-665.58	-769.22	-595.23	0.00	0.00	0.00
9,800.00	90.13	359.72	8,473.12	-565.58	-769.70	-495.57	0.00	0.00	0.00
9,900.00	90.13	359.72	8,472.89	-465.58	-770.19	-395.92	0.00	0.00	0.00
10,000.00	90.13	359.72	8,472.66	-365.58	-770.67	-296.27	0.00	0.00	0.00
10,100.00	90.13	359.72	8,472.43	-265.58	-771.15	-196.62	0.00	0.00	0.00
10,200.00	90.13	359.72	8,472.20	-165.59	-771.63	-96.96	0.00	0.00	0.00
10,300.00	90.13	359.72	8,471.98	-65.59	-772.12	2.69	0.00	0.00	0.00

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Heads CC 9_4 Federal Com 21H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2966.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2966.70ft
Site:	Heads CC 9_4	North Reference:	Grid
Well:	Heads CC 9_4 Federal Com 21H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
10,400.00	90.13	359.72	8,471.75	34.41	-772.60	102.34	0.00	0.00	0.00	
10,500.00	90.13	359.72	8,471.52	134.41	-773.08	201.99	0.00	0.00	0.00	
10,600.00	90.13	359.72	8,471.29	234.41	-773.57	301.65	0.00	0.00	0.00	
10,700.00	90.13	359.72	8,471.06	334.41	-774.05	401.30	0.00	0.00	0.00	
10,800.00	90.13	359.72	8,470.83	434.41	-774.53	500.95	0.00	0.00	0.00	
10,900.00	90.13	359.72	8,470.60	534.40	-775.02	600.60	0.00	0.00	0.00	
11,000.00	90.13	359.72	8,470.37	634.40	-775.50	700.26	0.00	0.00	0.00	
11,100.00	90.13	359.72	8,470.15	734.40	-775.98	799.91	0.00	0.00	0.00	
11,200.00	90.13	359.72	8,469.92	834.40	-776.47	899.56	0.00	0.00	0.00	
11,300.00	90.13	359.72	8,469.69	934.40	-776.95	999.21	0.00	0.00	0.00	
11,400.00	90.13	359.72	8,469.46	1,034.40	-777.43	1,098.86	0.00	0.00	0.00	
11,500.00	90.13	359.72	8,469.23	1,134.40	-777.91	1,198.52	0.00	0.00	0.00	
11,600.00	90.13	359.72	8,469.00	1,234.39	-778.40	1,298.17	0.00	0.00	0.00	
11,700.00	90.13	359.72	8,468.77	1,334.39	-778.88	1,397.82	0.00	0.00	0.00	
11,800.00	90.13	359.72	8,468.55	1,434.39	-779.36	1,497.47	0.00	0.00	0.00	
11,900.00	90.13	359.72	8,468.32	1,534.39	-779.85	1,597.13	0.00	0.00	0.00	
12,000.00	90.13	359.72	8,468.09	1,634.39	-780.33	1,696.78	0.00	0.00	0.00	
12,100.00	90.13	359.72	8,467.86	1,734.39	-780.81	1,796.43	0.00	0.00	0.00	
12,200.00	90.13	359.72	8,467.63	1,834.39	-781.30	1,896.08	0.00	0.00	0.00	
12,300.00	90.13	359.72	8,467.40	1,934.38	-781.78	1,995.74	0.00	0.00	0.00	
12,400.00	90.13	359.72	8,467.17	2,034.38	-782.26	2,095.39	0.00	0.00	0.00	
12,500.00	90.13	359.72	8,466.95	2,134.38	-782.75	2,195.04	0.00	0.00	0.00	
12,600.00	90.13	359.72	8,466.72	2,234.38	-783.23	2,294.69	0.00	0.00	0.00	
12,700.00	90.13	359.72	8,466.49	2,334.38	-783.71	2,394.34	0.00	0.00	0.00	
12,800.00	90.13	359.72	8,466.26	2,434.38	-784.19	2,494.00	0.00	0.00	0.00	
12,900.00	90.13	359.72	8,466.03	2,534.38	-784.68	2,593.65	0.00	0.00	0.00	
13,000.00	90.13	359.72	8,465.80	2,634.37	-785.16	2,693.30	0.00	0.00	0.00	
13,100.00	90.13	359.72	8,465.57	2,734.37	-785.64	2,792.95	0.00	0.00	0.00	
13,200.00	90.13	359.72	8,465.34	2,834.37	-786.13	2,892.61	0.00	0.00	0.00	
13,300.00	90.13	359.72	8,465.12	2,934.37	-786.61	2,992.26	0.00	0.00	0.00	
13,400.00	90.13	359.72	8,464.89	3,034.37	-787.09	3,091.91	0.00	0.00	0.00	
13,500.00	90.13	359.72	8,464.66	3,134.37	-787.58	3,191.56	0.00	0.00	0.00	
13,600.00	90.13	359.72	8,464.43	3,234.37	-788.06	3,291.22	0.00	0.00	0.00	
13,700.00	90.13	359.72	8,464.20	3,334.36	-788.54	3,390.87	0.00	0.00	0.00	
13,800.00	90.13	359.72	8,463.97	3,434.36	-789.03	3,490.52	0.00	0.00	0.00	
13,900.00	90.13	359.72	8,463.74	3,534.36	-789.51	3,590.17	0.00	0.00	0.00	
14,000.00	90.13	359.72	8,463.52	3,634.36	-789.99	3,689.83	0.00	0.00	0.00	
14,100.00	90.13	359.72	8,463.29	3,734.36	-790.47	3,789.48	0.00	0.00	0.00	
14,200.00	90.13	359.72	8,463.06	3,834.36	-790.96	3,889.13	0.00	0.00	0.00	
14,300.00	90.13	359.72	8,462.83	3,934.36	-791.44	3,988.78	0.00	0.00	0.00	
14,400.00	90.13	359.72	8,462.60	4,034.35	-791.92	4,088.43	0.00	0.00	0.00	
14,500.00	90.13	359.72	8,462.37	4,134.35	-792.41	4,188.09	0.00	0.00	0.00	
14,600.00	90.13	359.72	8,462.14	4,234.35	-792.89	4,287.74	0.00	0.00	0.00	
14,700.00	90.13	359.72	8,461.91	4,334.35	-793.37	4,387.39	0.00	0.00	0.00	
14,800.00	90.13	359.72	8,461.69	4,434.35	-793.86	4,487.04	0.00	0.00	0.00	
14,900.00	90.13	359.72	8,461.46	4,534.35	-794.34	4,586.70	0.00	0.00	0.00	
15,000.00	90.13	359.72	8,461.23	4,634.35	-794.82	4,686.35	0.00	0.00	0.00	
15,100.00	90.13	359.72	8,461.00	4,734.34	-795.31	4,786.00	0.00	0.00	0.00	
15,200.00	90.13	359.72	8,460.77	4,834.34	-795.79	4,885.65	0.00	0.00	0.00	
15,300.00	90.13	359.72	8,460.54	4,934.34	-796.27	4,985.31	0.00	0.00	0.00	
15,400.00	90.13	359.72	8,460.31	5,034.34	-796.76	5,084.96	0.00	0.00	0.00	
15,500.00	90.13	359.72	8,460.09	5,134.34	-797.24	5,184.61	0.00	0.00	0.00	
15,600.00	90.13	359.72	8,459.86	5,234.34	-797.72	5,284.26	0.00	0.00	0.00	
15,700.00	90.13	359.72	8,459.63	5,334.34	-798.20	5,383.92	0.00	0.00	0.00	

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Heads CC 9_4 Federal Com 21H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2966.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2966.70ft
Site:	Heads CC 9_4	North Reference:	Grid
Well:	Heads CC 9_4 Federal Com 21H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
15,800.00	90.13	359.72	8,459.40	5,434.33	-798.69	5,483.57	0.00	0.00	0.00	
15,900.00	90.13	359.72	8,459.17	5,534.33	-799.17	5,583.22	0.00	0.00	0.00	
16,000.00	90.13	359.72	8,458.94	5,634.33	-799.65	5,682.87	0.00	0.00	0.00	
16,100.00	90.13	359.72	8,458.71	5,734.33	-800.14	5,782.52	0.00	0.00	0.00	
16,200.00	90.13	359.72	8,458.48	5,834.33	-800.62	5,882.18	0.00	0.00	0.00	
16,300.00	90.13	359.72	8,458.26	5,934.33	-801.10	5,981.83	0.00	0.00	0.00	
16,400.00	90.13	359.72	8,458.03	6,034.33	-801.59	6,081.48	0.00	0.00	0.00	
16,500.00	90.13	359.72	8,457.80	6,134.32	-802.07	6,181.13	0.00	0.00	0.00	
16,600.00	90.13	359.72	8,457.57	6,234.32	-802.55	6,280.79	0.00	0.00	0.00	
16,700.00	90.13	359.72	8,457.34	6,334.32	-803.04	6,380.44	0.00	0.00	0.00	
16,800.00	90.13	359.72	8,457.11	6,434.32	-803.52	6,480.09	0.00	0.00	0.00	
16,900.00	90.13	359.72	8,456.88	6,534.32	-804.00	6,579.74	0.00	0.00	0.00	
17,000.00	90.13	359.72	8,456.66	6,634.32	-804.48	6,679.40	0.00	0.00	0.00	
17,100.00	90.13	359.72	8,456.43	6,734.32	-804.97	6,779.05	0.00	0.00	0.00	
17,200.00	90.13	359.72	8,456.20	6,834.31	-805.45	6,878.70	0.00	0.00	0.00	
17,300.00	90.13	359.72	8,455.97	6,934.31	-805.93	6,978.35	0.00	0.00	0.00	
17,400.00	90.13	359.72	8,455.74	7,034.31	-806.42	7,078.00	0.00	0.00	0.00	
17,500.00	90.13	359.72	8,455.51	7,134.31	-806.90	7,177.66	0.00	0.00	0.00	
17,600.00	90.13	359.72	8,455.28	7,234.31	-807.38	7,277.31	0.00	0.00	0.00	
17,700.00	90.13	359.72	8,455.05	7,334.31	-807.87	7,376.96	0.00	0.00	0.00	
17,800.00	90.13	359.72	8,454.83	7,434.31	-808.35	7,476.61	0.00	0.00	0.00	
17,900.00	90.13	359.72	8,454.60	7,534.30	-808.83	7,576.27	0.00	0.00	0.00	
18,000.00	90.13	359.72	8,454.37	7,634.30	-809.32	7,675.92	0.00	0.00	0.00	
18,100.00	90.13	359.72	8,454.14	7,734.30	-809.80	7,775.57	0.00	0.00	0.00	
18,200.00	90.13	359.72	8,453.91	7,834.30	-810.28	7,875.22	0.00	0.00	0.00	
18,300.00	90.13	359.72	8,453.68	7,934.30	-810.76	7,974.88	0.00	0.00	0.00	
18,400.00	90.13	359.72	8,453.45	8,034.30	-811.25	8,074.53	0.00	0.00	0.00	
18,500.00	90.13	359.72	8,453.23	8,134.30	-811.73	8,174.18	0.00	0.00	0.00	
18,600.00	90.13	359.72	8,453.00	8,234.29	-812.21	8,273.83	0.00	0.00	0.00	
18,700.00	90.13	359.72	8,452.77	8,334.29	-812.70	8,373.49	0.00	0.00	0.00	
18,800.00	90.13	359.72	8,452.54	8,434.29	-813.18	8,473.14	0.00	0.00	0.00	
18,900.00	90.13	359.72	8,452.31	8,534.29	-813.66	8,572.79	0.00	0.00	0.00	
19,000.00	90.13	359.72	8,452.08	8,634.29	-814.15	8,672.44	0.00	0.00	0.00	
19,100.00	90.13	359.72	8,451.85	8,734.29	-814.63	8,772.09	0.00	0.00	0.00	
19,200.00	90.13	359.72	8,451.62	8,834.29	-815.11	8,871.75	0.00	0.00	0.00	
19,300.00	90.13	359.72	8,451.40	8,934.28	-815.60	8,971.40	0.00	0.00	0.00	
19,400.00	90.13	359.72	8,451.17	9,034.28	-816.08	9,071.05	0.00	0.00	0.00	
19,500.00	90.13	359.72	8,450.94	9,134.28	-816.56	9,170.70	0.00	0.00	0.00	
19,600.00	90.13	359.72	8,450.71	9,234.28	-817.04	9,270.36	0.00	0.00	0.00	
19,604.36	90.13	359.72	8,450.70	9,238.64	-817.07	9,274.70	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude		Longitude
PBHL (Heads CC 9_4 - plan hits target center - Point	0.00	0.00	8,450.70	9,238.64	-817.07	456,292.20	645,300.00	32° 15' 14.309888 N	103° 59' 49.300895	
FTP (Heads CC 9_4 - plan hits target center - Point	0.00	0.00	8,474.70	-1,257.10	-766.36	445,797.30	645,350.70	32° 13' 30.452154 N	103° 59' 49.093233	

Oxy

Planning Report

Database:	HOPSPP	Local Co-ordinate Reference:	Well Heads CC 9_4 Federal Com 21H
Company:	ENGINEERING DESIGNS	TVD Reference:	RKB=26.5' @ 2966.70ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	RKB=26.5' @ 2966.70ft
Site:	Heads CC 9_4	North Reference:	Grid
Well:	Heads CC 9_4 Federal Com 21H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permitting Plan		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,347.00	1,347.00	0.00	0.00	Build 2.00°/100'	
2,246.82	2,232.10	-131.21	-49.29	Hold 18.00° Tangent	
8,039.37	7,741.25	-1,806.55	-678.64	KOP, Build 10.00°/100'	
9,108.47	8,474.70	-1,257.10	-766.36	Landing Point	
19,604.36	8,450.70	9,238.64	-817.07	TD at 19604.36' MD	



Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Heads CC 9_4
Well: Heads CC 9_4 Federal Com 21H
Wellbore: Wellbore #1
Design: Permitting Plan

PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

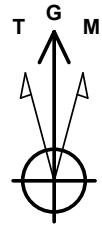
System Datum: Mean Sea Level

WELL DETAILS: Heads CC 9_4 Federal Com 21H

+N/-S	+E/-W	Ground Level:	2940.20
0.00	0.00	Northing	447054.30
		Eastings	646117.00
		Latitude	32° 13' 42.867457 N
		Longitude	103° 59' 40.126059 W

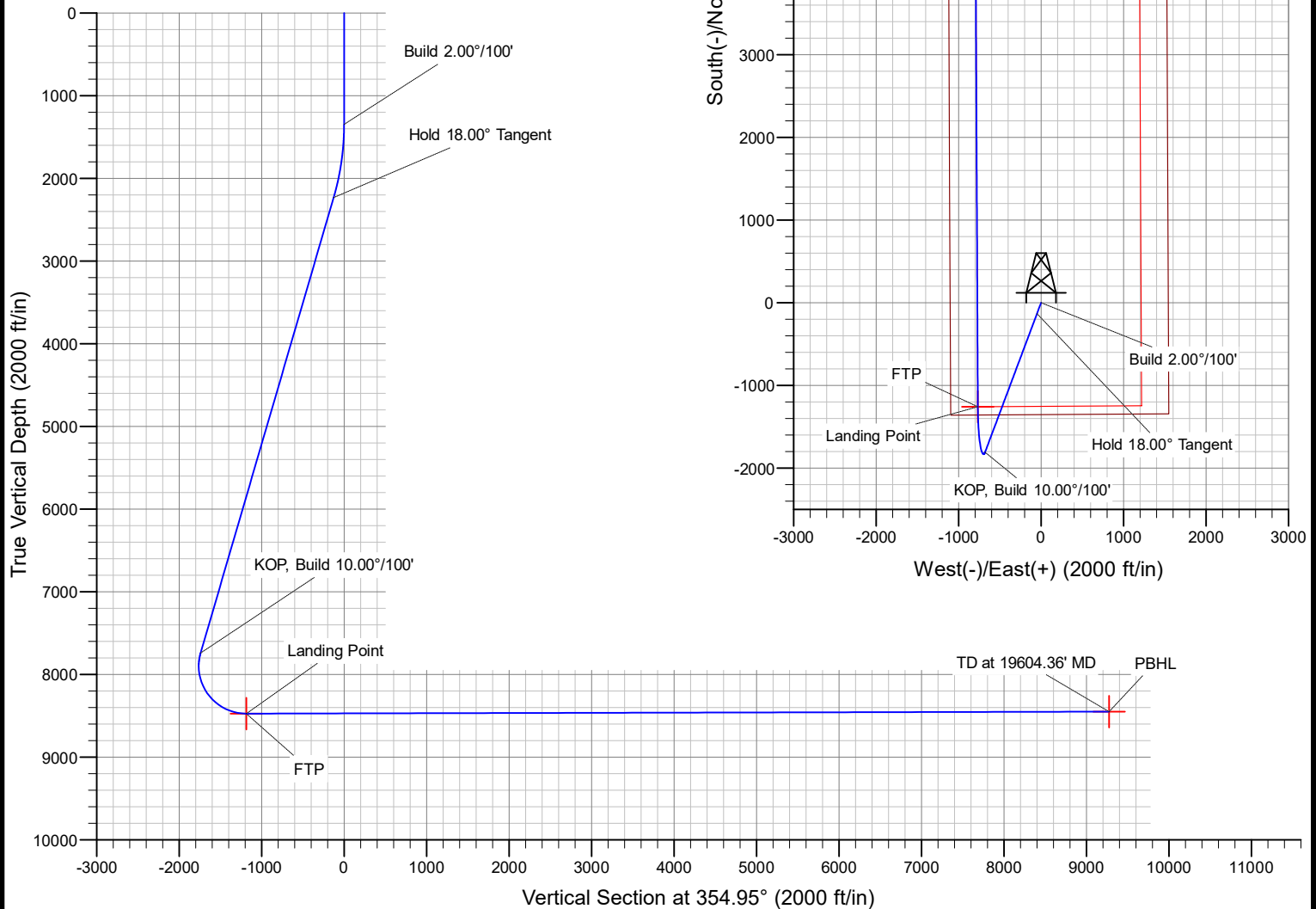
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1347.00	0.00	0.00	1347.00	0.00	0.00	0.00	0.00	0.00	Build 2.00°/100'
2246.82	18.00	200.59	2232.10	-131.21	-49.29	2.00	200.59	-126.35	Hold 18.00° Tangent
8039.37	18.00	200.59	7741.25	-1806.55	-678.64	0.00	0.00	-1739.74	KOP, Build 10.00°/100'
9108.47	90.13	359.72	8474.70	-1257.10	-766.36	10.00	158.14	-1184.70	Landing Point
19604.36	90.13	359.72	8450.70	9238.64	-817.07	0.00	0.00	9274.70	TD at 19604.36' MD



Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.79°

Magnetic Field
Strength: 47892.0snT
Dip Angle: 59.95°
Date: 7/17/2019
Model: HDGM



OXY USA Inc. - Heads CC 9-4 Federal Com 21H – Drill Plan

1. Geologic Formations

TVD of target	8475'	Pilot Hole Depth	N/A
MD at TD:	19604'	Deepest Expected fresh water:	143'

Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	143	
Salado	617	Salt
Castile	1,297	Salt
Lamar/Delaware	2,862	Oil/Gas/Brine
Bell Canyon	2,926	Oil/Gas/Brine
Cherry Canyon	3,775	Oil/Gas/Brine
Brushy Canyon	5,025	Losses
Bone Spring	6,597	Oil/Gas
1st Bone Spring	7,603	Oil/Gas
2nd Bone Spring	8,418	Oil/Gas

*H₂S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size (in)	Casing Interval		Csg. Size (in)	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	Buoyant Body SF	Buoyant Joint SF
	From (ft)	To (ft)							Tension	Tension
14.75	0	557	10.75	40.5	J-55	BTC	1.125	1.2	1.4	1.4
9.875	0	7939	7.625	26.4	L-80 HC	BTC	1.125	1.2	1.4	1.4
6.75	0	19604	5.5	20	P-110	DQX	1.125	1.2	1.4	1.4
SF Values will meet or Exceed										

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancellation cone and not pump the second stage.

*Oxy requests the option to run production casing with DQX, SF TORQ, and/or DQW TORQ connections to accommodate hole conditions or drilling operations.

OXY USA Inc. - Heads CC 9-4 Federal Com 21H – Drill Plan

Annular Clearance Variance Request

As per the agreement reached in the Oxy/BLM meeting on Feb 22, 2018, Oxy requests permission to allow deviation from the 0.422” annular clearance requirement from Onshore Order #2 under the following conditions:

1. Annular clearance to meet or exceed 0.422” between intermediate casing ID and production casing coupling only on the first 500’ overlap between both casings.
2. Annular clearance less than 0.422” is acceptable for the curve and lateral portions of the production open hole section.

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	Y
Does the above casing design meet or exceed BLM’s minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50’ above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500’ into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100’ to 600’ below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

OXY USA Inc. - Heads CC 9-4 Federal Com 21H – Drill Plan

3. Cementing Program

Casing String	# Sk	Wt. (lb/gal)	Yld (ft ³ /sack)	H ₂ O (gal/sk)	500# Comp. Strength (hours)	Slurry Description
Surface (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Surface (Tail)	453	14.8	1.33	6.365	5:26	Class C Cement, Accelerator
Intermediate 1st Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	371	13.2	1.65	8.640	11:54	Class H Cement, Retarder, Dispersant, Salt
Intermediate 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus						
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	649	12.9	1.92	10.41	23:10	Class C Cement, Accelerator
Production (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Production (Tail)	892	13.2	1.38	6.686	3:39	Class H Cement, Retarder, Dispersant, Salt

Casing String	Top (ft)	Bottom (ft)	% Excess
Surface (Lead)	N/A	N/A	N/A
Surface (Tail)	0	557	100%
Intermediate 1st Stage (Lead)	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	5275	7939	5%
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	0	5275	10%
Production (Lead)	N/A	N/A	N/A
Production (Tail)	7439	19604	20%

*OXY requests a variance to cement the 7-5/8" intermediate casing string offline, see attached for additional information.

OXY USA Inc. - Heads CC 9-4 Federal Com 21H – Drill Plan

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
9.875" Hole	13-5/8"	3M	Annular	✓	70% of working pressure
		3M	Blind Ram	✓	250 psi / 3000 psi
			Pipe Ram		
			Double Ram	✓	
			Other*		
6.75" Hole	13-5/8"	3M	Annular	✓	70% of working pressure
		3M	Blind Ram	✓	250 psi / 3000 psi
			Pipe Ram		
			Double Ram	✓	
			Other*		

*Specify if additional ram is utilized.

Oxy will utilize a 5M annular with a 10M BOPE stack. The BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
Y	Are anchors required by manufacturer?
	A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015. See attached schematics.

OXY USA Inc. - Heads CC 9-4 Federal Com 21H – Drill Plan

BOP Break Testing Request

As per the agreement reached in the Oxy/BLM meeting on Feb 22, 2018, Oxy requests permission to allow BOP Break Testing under the following conditions:

- After a full BOP test is conducted on the first well on the pad.
- When skidding to drill an intermediate section that casing point is either shallower than the third Bone Spring or 10,000 feet TVD.
- Full BOP test will be required prior to drilling any production hole.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	557	Water-Based Mud	8.6-8.8	40-60	N/C
557	7939	Saturated Brine-Based or Oil-Based Mud	8.0-10.0	35-45	N/C
7939	19604	Water-Based or Oil-Based Mud	8.0-9.6	38-50	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

What will be used to monitor the loss or gain of fluid?	PVT/MD Totco/Visual Monitoring
---	--------------------------------

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Yes	Will run GR from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
No	Logs are planned based on well control or offset log information.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned		Interval
No	Resistivity	
No	Density	
No	CBL	
Yes	Mud log	ICP - TD
No	PEX	

OXY USA Inc. - Heads CC 9-4 Federal Com 21H – Drill Plan

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4231 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	148°F

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

Hydrogen Sulfide (H ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H ₂ S is present
Y	H ₂ S Plan attached

8. Other facets of operation

	Yes/No
Will the well be drilled with a walking/skidding operation? If yes, describe. <ul style="list-style-type: none">We plan to drill the three well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.	Yes
Will more than one drilling rig be used for drilling operations? If yes, describe. <ul style="list-style-type: none">Oxy requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Oxy would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig.	Yes

Total estimated cuttings volume: 1333.3 bbls.

9. Company Personnel

Name	Title	Office Phone	Mobile Phone
Garrett Granier	Drilling Engineer	713-513-6633	832-265-0581
William Turner	Drilling Engineer Supervisor	713-350-4951	661-817-4586
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
Diego Tellez	Drilling Manager	713-350-4602	713-303-4932

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

Date: 08/15/2019

☒ Original

Operator & OGRID No.: OXY USA INC. - 16696

☐ Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Heads CC 9-4 Fd Com 1H	Pending	M-9-24S-29E	350 FSL 235 FWL	3,100	0	
Heads CC 9-4 Fd Com 2H	Pending	M-9-24S-29E	350 FSL 305 FWL	3,100	0	
Heads CC 9-4 Fd Com 3H	Pending	N-9-24S-29E	520 FSL 2400 FWL	3,100	0	
Heads CC 9-4 Fd Com 4H	Pending	N-9-24S-29E	520 FSL 2435 FWL	3,100	0	
Heads CC 9-4 Fd Com 5H	Pending	O-9-24S-29E	910 FSL 1365 FEL	3,100	0	
Heads CC 9-4 Fd Com 6H	Pending	P-9-24S-29E	910 FSL 1295 FEL	3,100	0	
Heads CC 9-4 Fd Com 11H	Pending	M-9-24S-29E	350 FSL 270 FWL	3,800	0	
Heads CC 9-4 Fd Com 12H	Pending	N-9-24S-29E	520 FSL 2365 FWL	3,800	0	
Heads CC 9-4 Fd Com 13H	Pending	N-9-24S-29E	520 FSL 2465 FWL	3,800	0	
Heads CC 9-4 Fd Com 14H	Pending	O-9-24S-29E	910 FSL 1330 FEL	3,800	0	
Heads CC 9-4 Fd Com 21H	Pending	L-9-24S-29E	1353 FSL 1102 FWL	2,000	0	
Heads CC 9-4 Fd Com 22H	Pending	L-9-24S-29E	1349 FSL 1137 FWL	2,000	0	
Heads CC 9-4 Fd Com 23H	Pending	L-9-24S-29E	1344 FSL 1172 FWL	2,000	0	
Heads CC 9-4 Fd Com 24H	Pending	O-9-24S-29E	487 FSL 1667 FEL	2,000	0	
Heads CC 9-4 Fd Com 25H	Pending	O-9-24S-29E	482 FSL 1632 FEL	2,000	0	
Heads CC 9-4 Fd Com 26H	Pending	O-9-24S-29E	478 FSL 1597 FEL	2,000	0	
Heads CC 9-4 Fd Com 31H	Pending	M-9-24S-29E	250 FSL 880 FWL	5,500	0	
Heads CC 9-4 Fd Com 22H	Pending	M-9-24S-29E	250 FSL 915 FWL	5,500	0	
Heads CC 9-4 Fd Com 33H	Pending	M-9-24S-29E	250 FSL 950 FWL	5,500	0	
Heads CC 9-4 Fd Com 34H	Pending	O-9-24S-29E	100 FSL 2163 FEL	5,500	0	
Heads CC 9-4 Fd Com 35H	Pending	O-9-24S-29E	100 FSL 2128 FEL	5,500	0	
Heads CC 9-4 Fd Com 36H	Pending	B-16-24S-29E	963 FNL 1646 FEL	5,500	0	
Heads CC 9-4 Fd Com 37H	Pending	C-16-24S-29E	792 FNL 1654 FWL	5,500	0	
Heads CC 9-4 Fd Com 38H	Pending	B-16-24S-29E	960 FNL 1680 FEL	5,500	0	
Heads CC 9-4 Fd Com 311H	Pending	C-16-24S-29E	789 FNL 1619 FWL	5,500	0	
Heads CC 9-4 Fd Com 312H	Pending	B-16-24S-29E	957 FNL 1715 FEL	5,500	0	
Heads CC 9-4 Fd Com 41H	Pending	D-16-24S-29E	760 FNL 1280 FWL	7,000	0	
Heads CC 9-4 Fd Com 42H	Pending	D-16-24S-29E	765 FNL 1345 FWL	7,000	0	
Heads CC 9-4 Fd Com 43H	Pending	B-16-24S-29E	933 FNL 1989 FEL	7,000	0	
Heads CC 9-4 Fd Com 44H	Pending	B-16-24S-29E	936 FNL 1954 FEL	7,000	0	

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Heads CC 9-4 Fd Com 51H	Pending	D-16-24S-29E	762 FNL 1310 FWL	7,000	0	
Heads CC 9-4 Fd Com 52H	Pending	C-16-24S-29E	768 FNL 1380 FWL	7,000	0	
Heads CC 9-4 Fd Com 53H	Pending	A-16-24S-29E	1017 FNL 1040 FEL	7,000	0	
Heads CC 9-4 Fd Com 54H	Pending	A-16-24S-29E	1020 FNL 1005 FEL	7,000	0	
Heads CC 9-4 Fd Com 71H	Pending	N-9-24S-29E	520 FSL 2090 FWL	1,200	0	
Heads CC 9-4 Fd Com 72H	Pending	N-9-24S-29E	520 FSL 2125 FWL	1,200	0	
Heads CC 9-4 Fd Com 73H	Pending	B-16-24S-29E	380 FNL 1525 FEL	1,200	0	
Heads CC 9-4 Fd Com 74H	Pending	B-16-24S-29E	415 FNL 1525 FEL	1,200	0	

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, where a gas transporter system is in place. The gas produced from production facility is dedicated to Enterprise Field Services, LLC (“Enterprise”) and is connected to Enterprise low/high pressure gathering system located in Eddy County, New Mexico. OXY USA INC. (“OXY”) provides (periodically) to Enterprise a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, OXY and Enterprise have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at OXY USA WTP LP Processing Plant located in Sec. 23, Twn. 21S, Rng. 23E, Eddy County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Enterprise system at that time. Based on current information, it is OXY’s belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

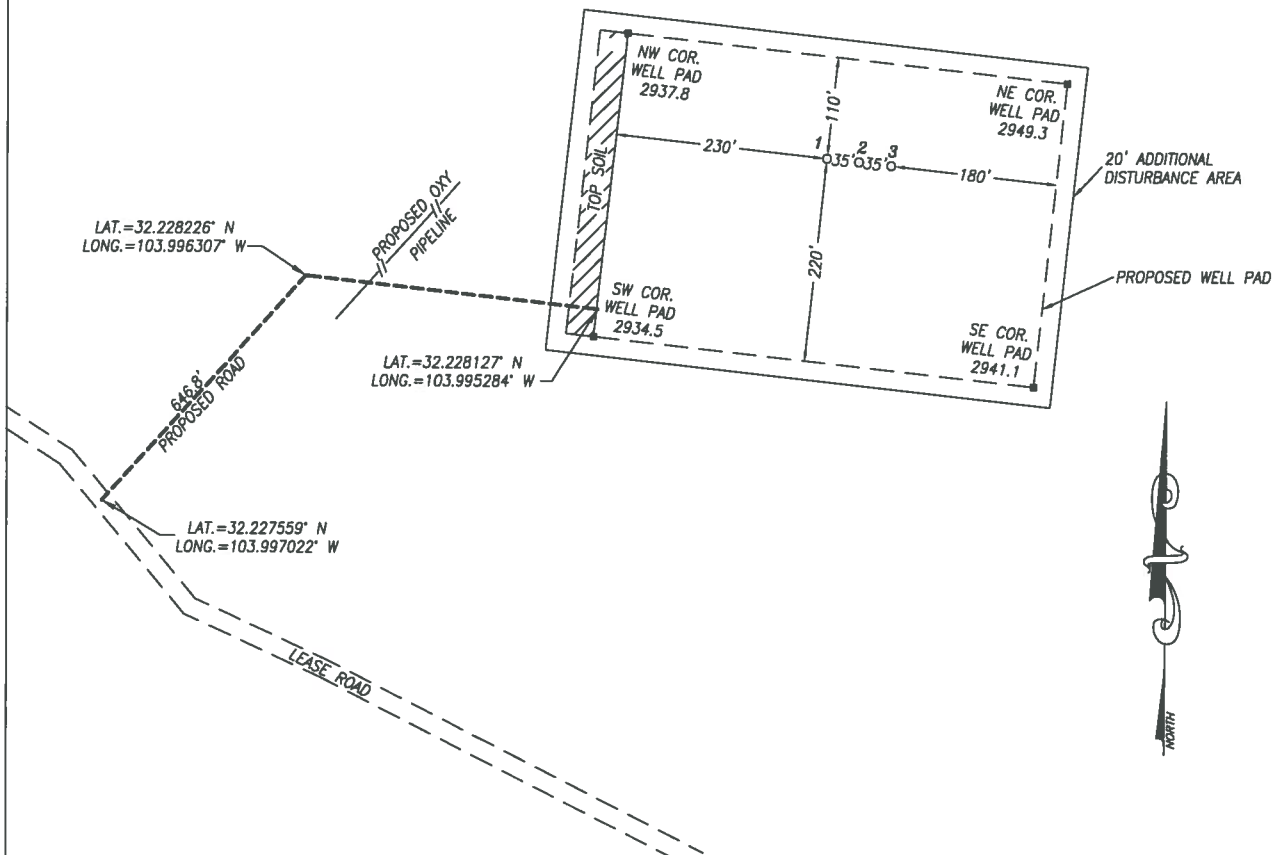
Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

OXY USA INC.

SITE PLAN CEDCAN 0902 FAA PERMIT: NO



NO.	WELL	FOOTAGE	LAT.	LONG.	ELEV.	ID#
1	HEADS CC 9_4 FED COM #21H	1353' FSL & 1102' FWL	32.228574° N	103.994479° W	2940.2'	IP-SMS-2103
2	HEADS CC 9_4 FED COM #22H	1349' FSL & 1137' FWL	32.228564° N	103.994367° W	2939.4'	IP-SMS-2104
3	HEADS CC 9_4 FED COM #23H	1344' FSL & 1172' FWL	32.228553° N	103.994255° W	2940.0'	IP-SMS-2105

NOTES:

- 1) LATS & LONGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983.
- 2) DISTANCES ARE GRID VALUES.
- 3) ALL FEATURES ARE EXISTING UNLESS OTHERWISE NOTED

CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

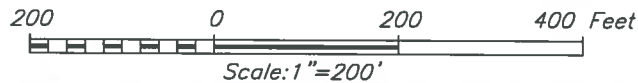


Chad Harcrow

CHAD HARCROW N.M.P.S. NO. 17777

6/19/19
DATE

HARCROW SURVEYING, LLC
2316 W. MAIN ST, ARTESIA, N.M. 88210
PH: (575) 746-2158
c.harcrow@harcrowsurveying.com

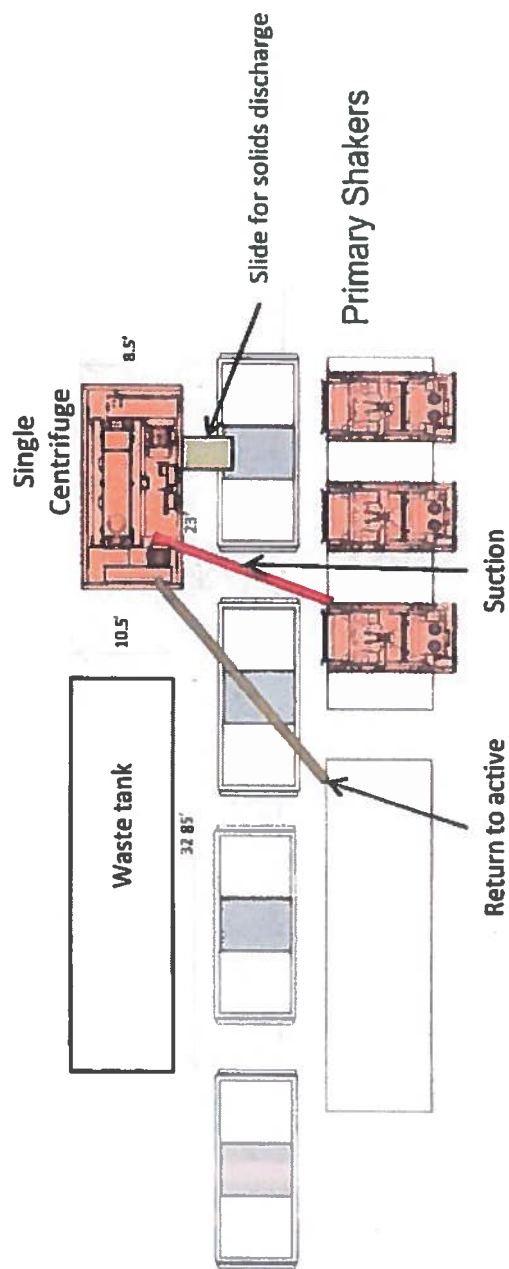


OXY USA INC.

SURVEY DATE: MAY 30, 2019	SITE PLAN
DRAFTING DATE: JUNE 13, 2019	PAGE: 1 OF 1
APPROVED BY: CH	DRAWN BY: WN
FILE: 19-335-337	

Roll off bins – for waste solids

Oxy



Well Head

Oxy Single Centrifuge
Closed Loop System – New
Mexico Flex III
May 28, 2013